### KING COUNTY DEPARTMENT OF TRANSPORTATION **CONSTRUCTION SERVICES SECTION**

# INSPECTORS DAILY REPORT Page 2 of 2 DATE: Monday September 21st 2009

-	Per Kevin, WSDOT will be on the job on 09/23 and 09/24/09 to core mix for gauge correlation factor. County core machine is out of
	service.

-	Contractor set VMS signs on each end of project regarding road closure from 09/22 to 09/25/09. County install	led temp.	Signs
	informing about road closure.		

) <del></del>		
	Inspector(s) Time:	
White - Contract File Yellow - Project Engineer		
Pink - Inspector's Diary	Inspector's Signature:	

### SE 416<sup>th</sup> Street Overlay: Shingles in Paving Demonstration

### **Construction Inspection and Quality Control Testing**

Paving Day 1 (9-22-09)

Inspectors Daily Report
HMA Test Results
HMA Mineral Aggregate Test Results
HMA Compaction Test Results

#### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

### **INSPECTORS DAILY REPORT Page 1 of 2**

<sub>DATE:</sub> Tuesday September 22nd 2009

Federal Aid # PROJECT NO. <b>M78030</b>	Contract No. <b>C00455C09</b>	Project:	SE 416	6th ST Overlay- Shingles Demonstration	in Paving
INSPECTOR (S):	S.Shandil, M.Pavolka	Con	TRACTOR:	Woodworth & Co	mpany
WEATHER:	Clear			TEMP: High 80	Low60
PROJECT NO. M78030 CONTRACT NO. C00455C09 PROJECT: SE 416th ST Overlay- Shingles in Pavir Demonstration  INSPECTOR (S): S.Shandil, M.Pavolka  CONTRACTOR: Woodworth & Company  Weather: Control Checked? Yes Clear  Temp: High 80 Lo  Workable 8 Nonworks  Signs and Traffic Control Checked? Yes X No On-Stie Interview? Yes  Woodworth (Paving): 6.20am Moby's sweeper on site to clean SE 416th. 7am Set up traffic control signs and flaggers on and various cross streets on SE 416th st. Road closed between 244th and 228thave. Crew Remove paper joint at 244th ave backineo. 7.10 place tack on North side of SE 416th up to 236th ave. Mob. Equipment. 7.30 begin paving from st # 116+27  Luke operating shuttle buggy to transfer mix on to paver. All operating Blaw Knox paver with Jonathan as screed operator. Susing Sakai as bidown roller with Willie operating DD-110HF as intermediate/finish roller and the DD-28HF for side streets and towards end of day 10.15 End paving at st# 89+66, place paper joint and continued on to pre level both side of SE 418 89+60 to 80+00. 11.55 End pre level, mob equipment back to 244Th AVE. Waited for 45 min. before resuming paving Sout 12.20 Tack South side. 12.50 place water on mat North side to drop temp. Paver broke down-Diesel leak. Fixed paver, clea and place more tack. 1.30 pave South side up to st#99+66. Continued on to prelevel North side of road from st# 78+50 to 7 at 4pm. continued to roll. Mat temp. About 180 deg. Compaction hard to achieve. Use DD-28HF to get compaction. Placed Road opened at 5pm.Flaggers continued to relocate detour signs for paving on 09/23/09. Done at 6pm.  Gloria Jeanne: (Grinding): Complete on 09/21/09.  Equipment on Project Manager (Soot Droppelman), 1- FM (Dan Andreas), 1- Paver operators (Al Anderson), 1- Shuttle to operator (Luke Dillard), 1- Screed operator (Jonathan Pullack), 2- Roller operators (Share Thomas, Willie Guillen), 1- Ti spotter (Dave Thorton), 1- Raker (Ludvig Yelimov), 1- Tack Operator (), 1- TCS (Tara), 4- Flaggers (Glen, Katy, Ray & Gloria Jeanne:	Nonworkable 0				
SIGNS AND TRAFFIC CONTRO	DL CHECKED? Yes X No			On-Site Interview? Ye	s No X
Work Done:		<del></del>			
and towards end of 89+60 to 80+00. 10 12.20 Tack South and place more to at 4pm. continued Road opened at 5.  Gloria Jeanne: (EQUIPMENT ON PROJ  Woodworth: 1- F. 1262), 1 Back Hoed I.R DD-110HF # 8.  Gloria Jeanne:  PERSONNEL OF Woodworth: 1- P. 1262 operator (Luke Disporter (Dave Those Gloria Jeanne:  King County: Paulo Others: Warren (Education of Sunta Su	of day.10.15 End paving at st# 89- 11.55 End pre level, mob equipment iside.12.50 place water on mat Noi ick. 1.30 pave South side up to st# if to roll. Mat temp. About 180 deg. (in the state of the s	+66, place paper th back to 244T of th side to drop 89+66. Continu Compaction hat detour signs for Work truck (F (SB- 2500B # th Water Truck ), 1- F/M (Dan an Pullack), 2- ),1 - Tack Ope	er joint and cor H AVE. Waited temp. Paver b ed on to prele rd to achieve. or paving on 09 450 + Trailer 1 715), 1- Pavel # 26, Peter Bi Andreas), 1- I - Roller operat	ntinued on to pre level both side of for 45 min. before resuming p proke down- Diesel leak. Fixed p vel North side of road from st# Use DD-28HF to get compaction 0/23/09.Done at 6pm. # 38) 1 – Flagging truck( Chevy r( Blaw Knox # 711), 3 Rollers( it Tack Truck # 9 Paver operators( Al Anderson), tors ( Shane Thomas, Willie Gu	e of SE 416th st# aving South side. paver, cleaned road 78+50 to 70+50. End on. Placed temp tapes y 2500 HD # 1264and I.R DD-28HF # 841 1- Shuttle buggy illen), 1- Truck
REMARKS:	oon 044th ave and 000th ave 51-			to atom com outsides to to	
	een 244th ave and 228th ave. Flag	igers at each n	ajor crossing i	to stop cars entering in to work	zone from 7am to
				static rolling pattern and DD-28	8 for Side Street /
- It seems that the r	rubber tires on Sakai were not warr	n enough in Mo	ming. It was p	• .	oil spots from
White - Contract File	In	SPECTOR(S) T	IME:		

INSPECTOR'S SIGNATURE:

Yellow - Project Engineer Pink - Inspector's Diary

#### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

### **INSPECTORS DAILY REPORT Page 2 of 2**

DATE: Tuesday September 22nd 2009

- Temperature of laid down mix ranged from 270 deg. To 300deg. outside temp. was in the mid 80deg. This affected compaction on the South side.
- Paver had Diesel leak at st # 115+90 to 116+27 on the South side.
- Pre level on the North side from st # 89+60 (0" at centre to 5" at edge) to st # 83+50(0" at centre to 6"at edge) and stopped at 80+00 (0" at centre to 3" at edge), Skipped bridge section and pre level North side from 78+70 to 70+50(0" at centre to 2" at edge). Pre level South side from st # 88+00(0" at centre to 5" at edge) to 83+50(0" at centre to 5" at edge) and stopped at 80+00(0" at centre to 2" at edge)
- Sakai broke down and could not be used on the South side from st # to st # 114+50. Used DD-110HF as break down and
  intermediate roller. Sakai back in service from st # 114+50.
- Advised Joe (Lab) to take compaction shots in between wheel ruts.
- Day 1 Paving was from station 116+27 to 89+66. Wood Worth haul mix from Lake View plant using 15 truck and trailers. Placed 971.42T of HMA Class ½" PG 64-22 with 15% Rap on Se 416th st at 2" compacted. Placed 227.19 T of same mix as prelevel on SE 416TH ST.
- All trucks came in with covered loads.
- Temp. of mix was 290 deg at 116+27, 270deg at 109+00,290deg at 100+00,295 deg at 95+00. Temperature stayed within 5 deg. of 295deg. For rest of day.

	INSPECTOR(S) TIME:	
White - Contract File		
Yellow - Project Engineer		
Pink - Inspector's Diary	INSPECTOR'S SIGNATURE:	



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

				iggr uggnirg				
			aving Den	no. Project Number:	N	178030		
Contractor:		worth & Co.		Contract Number:		04555C09	_	
Asphalt Supplier:			/iew	Sampling Location:		k Bed @ F		
Oil Source and G				Collection Date/Time:		2/09 @ 7:4		
Mix ID: MD	0090088	Sam	ple ID:	KC-09-1217	HMA Clas	ss:	1/2"	
G	radation (AASH	TO T 30)		Volum	netrics (AASH)	TO T 312)		
						1	Tolera	nces
Sieve Size	% Passing	Tolerar *LL	rces *UL	% Va @ Ndes	3.5	*LL 2.5	to	<b>*UL</b> 5.5
1 1/2"		to		% VMA @Ndes	13.9	12.5	to	N/A
1"		to		% VFA @ Ndes	74.8	65	to	75
3/4"	100	99 to	100	Dust/Asphalt Ratio	1.3	0.6	to	1.6
1/2"	94	90 to	100	Gmm (WSDOT FOP for	AASHTO T 209)	2.485	_	4.7 lb/ft³
3/8"	82	78 to	90	Gmb (ASTM D	2726)	2.399		
#4	58	to			Asphalt Content % (KCDOT FOP for AASHTO T 308)			
#8	39	35 to	43	% Water (WSDOT FOP)				5.3 2.0 max
#16	26	to		***************************************	*************************			
#30	18	to		Mix Temperature in °	F	332		
#50	12	to	,	Oil Temperature in °F		330	ě:	
#100	9	to		Air Temperature in °F		54	15	
#200	5.9	4.3 to	7.0	***************************************		**	E	
\ <u> </u>				*LL=Lower Limit UL	=Upper Limit			
		<i>3</i> )	Data fro	m Mix Design				
Aggregate So	ource B-333	B-160	0	Gb (Binder)	2004444444	1.028		
Asphalt Conte	ent Design	5.6%		Mixing Temperature i	n °F	313		
Anti Strip	1 4 4 7 7 4 7 1 4 1 1 1 1 1 1 1 1 1 1 1	0.00%	<u> </u>	Compaction Tempera	ature in °F	291		
Pbe		4.5		Number of Gyrations	@ Initial	8		
Gsb (Aggrega	ite Blend)	2.64		Number of Gyrations	@ Design	100		
Gsb (Fine Age	gregate)	2.599		ESAL'S (millions)		3	to	<30
Remarks:								
Sample was obtained by	ck was the 13th load	of the day. The ac	cumulative to	on ssmple was taken by Woodworth nage was 417.50. This is the first of 0.53.	n. Sample was obt of two samples to b	ained from tru e taken today	ck #100	)69T, mix
Material .	X meet	s to meet	above s	pecifications.		Copies	Distrib Reside	ution ent Engr.
Approved for Distribution By:	Materials Enginee	ir			2/2009 Date	<u> </u>	Const. Dens. I	Admin. Engineer
				minum L				

Weder y War wofslog

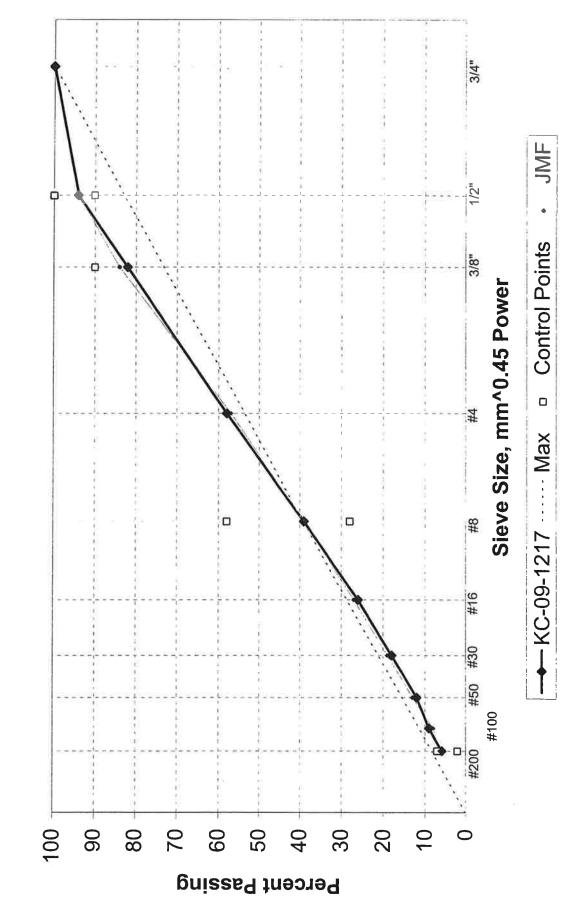


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M78030

Fax: (206) 296-0179

Project: SE 416th St Overlay, Shingles in Paving DemoProject Number: Woodworth & Co. Contractor: Contract Number: C004555C09 Woodworth Lakesview Asphalt Supplier: Sampling Location: Truck Bed @ Plant Collection Date/Time: Oil Source and Grade: U.S. Oil 9/22/09 @ 7:47 AM MD090088 KC-09-1217 HMA Class: 1/2" Mix ID: Sample ID: **Moisture Content (WSDOT FOP for AASHTO T329)** After 90 min. After 120 min. Time 9:10 10:40 11:15 541.5 541.5 541.5 Tare Weight Mass (Wt.) H<sub>2</sub>O 1141.0 1139.5 1139.4 1.6 Sample + Tare Wt. Percent H<sub>2</sub>O 599.5 598.0 597.9 Sample Weight 0.27 Ignition Furnace Data (AASHTO T 308) Mass of Empty Basket(s): 3057.8 Ignition Furnace ID: TIKI Mass of Baskets and Sample: 4600.2 Actual Asphalt Content in %: 5.3 Mass of Sample: 1542.4 Calibration Factor (Ticket) in %: 0.53 Mix Design Asphalt Content in %: 5.6 Percent Loss (Ticket) in %: 6.30 Mass of Residual Agg. & Basket: 4504.3 1446.5 Mass of Residual Agg. (Direct): Temperature Compensation (Ticket) in %: 0.19 Calibrated Asphalt Content (Ticket) in %: 5.58 Mass of Residual Agg. (Ticket): 1448.2 Difference of Masses of Residual Aggregate - Direct vs. Ticket = 0.1% Specification: shall be within +0.1%. Sieve Analysis (AASHTO T30) 1369.9 Mass of Dry Washed Residual Aggregate: Accumulative Tolerance Control Points Sieve Size Percent Passing **JMF** \*Record all sieves Upper Upper Lower Lower Weight Retained Limit Limit Limit Limit · Sieve Size 1 1/2" 1" 100 3/4" 0.0 100 100 99 100 100 100 90 90 1/2" 92.6 94 94 100 3/8" 253.7 82 84 78 90 0 90 58 57 #4 612.0 43 39 39 35 28 #8 889.1 58 27 1063.6 26 #16 19 1183.2 18 #30 12 13 #50 1265.7 1320.7 9 8 #100 6.3 4.3 7.0 2.0 7.0 #200 1361.2 5.9 Pan 1369.7 0.0% Specification: shall be within ± 0.2% Difference of Masses - Pan vs. Washed = Red = Outside Tolerance Limit **Bold = Within Tolerance Limits** Black Italic - At Tolerance Limit Sample was obtained by King County Representative Tara Pfaff. A companion ssmple was taken by Woodworth. Sample was obtained from truck #10069T, ticket #244759. This truck was the 13th load of the day. The accumulative tonage was 417.50. This is the first of two samples to be taken today. This mix contains 15% RAP. Ignition Furnace Calibration Factor changed from 0.63 to 0.53. X Material meets fails to meet above specifications.



Form: HMA - 0.45 Gradation Chart

## KC-09-1217

				Plant Ir	nformation				
Sampling Lo	cation	Truck	Bed @ Plant	Mix Temp	332	_			
Collection Dat	Collection Date/Time 9/22/09 @ 7:47 AM				330	_			
Sample ID		KC	C-09-1217	_Air Temp	54	_			
			G	yratory Data	(AASHTO T	T 312)			
Initial wt. of U	ncompac	ted mix.		4800.0	_				
Height in mm	of Sample	e @ Initial (	Gyrations	127.3	8		Compaction	Temp. =	291
Height in mm	of Sample	e @ Desigr	Gyrations	115.5	100				
			lgı	nition Furnac	e (AASHTO	T 308)			
Mass of Emp	ty Baske	et	3057.8	<u>-</u> -	Percent Lo	oss (Ticket	) in %:	6.30	_
Mass of Basi	ket & Sar	mple	4600.2	_	Temp. Cor	np. (Ticket	) in %:∍	0.19	_ Oil:
Sample Weig	jht		1542.4	_	Ignition Fu	ırnace ID:	9	TIKI	
Calibration F	actor in	<b>%</b> :	0.53	=	Mass of Ro	es. Agg. &	Bask.	4504.3	5.3
			Moisture Co	ontent (WSD	OT FOP for A	ASHTO T	329)		
Tare Weight		541.5	_	1		Min. test s	sample 500g.		
Sample + Tar	e Wt.	1141.0	_Time	9:10	_	163 +/- 14	°C for the ove	en temp.	
Sample + Tar	e Wt.	1139.5	_After 90 min.	10:40	_				Moist %:
Sample + Tar	e Wt.	1139.4	_After 120 min.	11:15	(Use Milita	ry Time, ex	c. 00:00)		0.27
				Rice Data (	ASTM D 204	1)			
						30 mm or	less Hg at 15	min.	
Sample Mass	•			1683.7					
Mass of Pycn				1277.5			Min. Mass		RICE:
Pycnometer (		•			<del></del> :	1/2"	1500g		154.7
Mass of Sam	-			2283.6	<del></del>	3/4"	2000g		
Temperature				24.8	_	1"	2500g		
		s (AASHI	TO T 30)			В	ulk Specific G	iravity	
Mass of Dry,	Washed	Sample	1369.9	-					
1 1/2"		#8	889.1	<b>-</b> J	Weight in A	۸ir			
1"		#16	1063.6	-	Weight in V			89.3	-
3/4"	0.0	#30	1183.2	-	Weight SS			97.3	<del>-</del> .
-	92.6	#50 #100	1265.7	-	Temp 25.0			93.6	-
===	253.7 612.0	#100 #200	1320.7	<b>-</b> a	p 20.0	0	2	5.1	-
#4	012.0	#200	1361.2	-91					

1369.7

# King County

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**HMA Volumetric Worksheet** 

Project:	SE 416th St Overlay,	Shingles in Paving	DemoProject Number:	C004555C	:09
Mix ID:	MD090088	Sample ID:	KC-09-1217	HMA Class:	1/2"
		Req	uired Data		
Percent B	inder (Pb)				5.3
% Pass #:	200 Sieve				5.9
Gmm (Ric	e Specific Gravity)				2.485
Compaction	on Temperature in °F				291
Initial Wei	ght of Uncompacted Mixture	,			4800.0
Number o	f Gyrations @ Initial				8
Number o	f Gyrations @ Design				100
Gb (Speci	fic Gravity of the Binder)				1.028
Gsb (Bulk	Specific Gravity of the Aggr	egate Blend)			2.64
	Theror	etical Maximum Speci	ific Gravity "Gmm" (ASTM	D 2041)	
(N) Sampl	e Mass				1683.7
(O) Mass	of Pycnometer Under Water				1277.5
( <del>P) Pycno</del>	meter Calibration @ 77°F				
(Q) Mass	of Sample & Pycnometer Ur	nder Water			2283.6
	erature of Water in °C				24.8
(S) Pycno	meter Calibration @ Test Te	emperature			
(T) Bitume	on Thermal Correction				
U) Water	Thermal Correction			-	1.00005
V) Gmm	@ 25°C = N*U/(N-(Q-O))				2.485
W) Densi	ity @ 25°C = V*62.245 lb/ft	3			154.7
		Bulk Specific Grav	ity "Gmb" (ASTM D2726)		
A = Mass	in Grams of Specimen in Air				4789.3
3 = Mass	in Grams of Surface-Dry Sp	ecimen in Air			4793.6
C = Mass	in Grams of Specimen in Wa	ater			2797.3
Temperati	ure of the Water °C				25.1
) = Temp	erature Correction for Densi	ty of Water			1.0000
Gmb =D A	A / (B-C)			(nearest 0.001)	2.399
Absorptic	on = ((B-A) / (B-C))*100			(nearest 0.001)	0.215%
		Gyratory Compact	or Data (AASHTO T 312)	The control of the co	
1 @ Nini (	Height of Sample @ Initial C	Syrations)			127.3
d @ Ndes	(Height of Sample @ Desig	n Gyrations)			115.5
% Gmm @	) N ini = (Hdes*Gmb)/(Hini	*Gmm)*100		(nearest 0.1)	87.6
% Gmm @	) N des = (Gmb)/(Gmm)*10	)0		(nearest 0.1)	96.5
		Air Voids (Va) {WS	SDOT Std. Spec. 9-03.8(7)}		
/a = 100 *	(1-(Gmb/Gmm))	JMF Toleranc	e = 2.5% to 5.5%	(nearest 0.1)	3.5
	Voids in	Mineral Aggregate (VI	MA) {WSDOT Std. Spec.	9-03.8(7)}	
/MA = 10	0 *(1-(Gmb*Ps/(Gsb*100)))		= Min. 14.0%	(nearest 0.1)	13.9
	Voids F	illed With Asphalt (VF	A) {WSDOT Std. Spec. 9	)-03.8(7)}	
/FA = 100	) * [(VMA - Va) / VMA]	Mix Criteri	a = 65 to 75	(nearest 0.1)	74.8
	Dust	/ Asphalt Ratio (D/A)	(WSDOT Std. Spec. 9-03	3.8(2)}	
3se = (10	0 - Pb) / [(100 /Gmm) - (Pb /		MAIC AND	(nearest 0.001)	2.699
	*Gb)*(Gse-Gsb)/(Gse*Gsb)			(nearest 0.1)	4.5
c <sub>s</sub> = 100 -	ru		ranno anazar antigra camin'i Manore antigra de la comi	(nearest 0.1)	94.7



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King County
Mix Design Requirements and Specifications

	ay, Shingles in Pa Voodworth & Co.	ving Demo.	Project Number: Contract Number		M78030 C004555C09 88 HMA Class: 1/2"		
sphalt Supplier:	Voodworth Lakesy	riew	Mix ID: MD090	0088 HM			
Source:	U.S. Oil		Resident Enginee	r: Fra	nk Over	ton	
		Gradatio	7				
	Contractor JM	F			Control P	oints	
Sieve Size	% Passing	** *	Tolerances		Class 1		
4.4/01		*LL	*UL			UL	
1 1/2" 1"							
3/4"	400		400	100		400	
1/2"	94	99	100	100		100	
3/8"	84	78	100 90	90		100	
						90	
#4 #8		52	62 43	20			
#0 #16	27	35	43	28		58	
#30	19						
#50	13						
#100	8					••••	
#200	6.3	4.3	7.0	2.0		7.0	
		B-160				7.0	
Aggregate Source (Pit #)	B-333 64-22		 _'S (millions)	2	40	-20	
Binder Grade (PG)	5.6	ESAL	-0 (1111110118)	<u>3</u> 5.1%	_ to	<30	
% Asphalt Content Design	0.00			5.1%	to	6.1%	
% Anti Strip % Water	0.00					20/	
% Va @ Ndes C	3.7	***************************************		2,5	to	2% max 5.5	
% VMA @Ndes C	14.3	***************************************	***************************************	14	— to		
% VFA @ Ndes C	74			65	— to	75	
Dust/Asphalt Ratio C	1.4			0.6	to	1.6	
Pbe C	4.5			0.0			
Gmm S	2.463	SE S	pecification			45	
Gmb S	2.374	Fract	***************************************	Single face	**************	90%	
		***********		Double face			
Gsb (Aggregate Blend)	<b>S</b> 2.640	Fine .	Aggregate Angularity		***************************************	44% min	
Gsb (Fine Aggregate)	<b>S</b> 2.599	(3 <del></del>			***************************************	•••	
Gb (Binder)	<b>S</b> 1.028						
Mixing Temperature in °F	313						
Max. Mixing Temperature in	°F 350						
Compaction Temperature in							
Number of Gyrations @ Initia	al 8				Copies D	stribution	
Number of Gyrations @ Des	ign 100				2 Re	sident Engr.	
Number of Gyrations @ Max				-		nst. Admin.	



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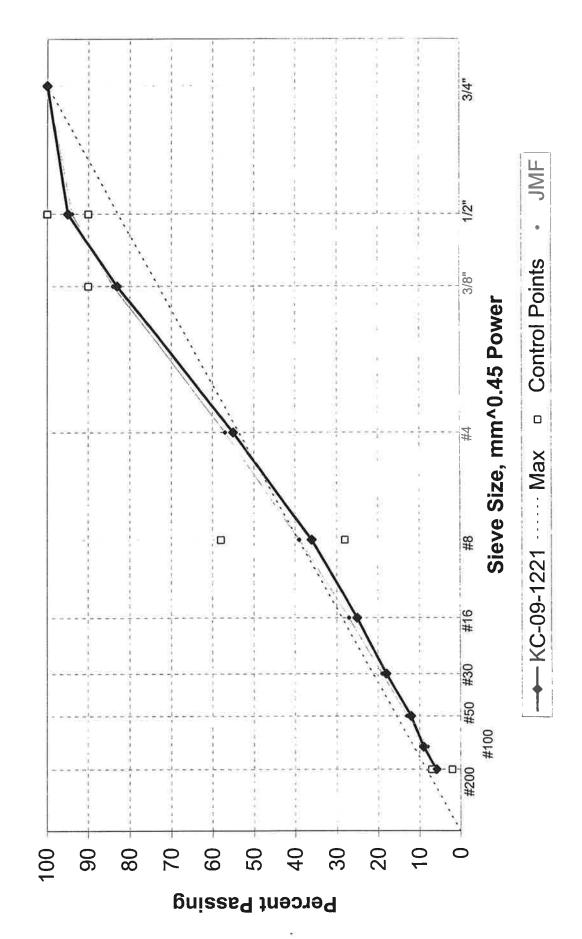
Deciset: OF 444	24h C4 O	himmina in B		o Dreiest Number		70000			
Contractor:		oningles in Pa vorth & Co.	aving Den	no. Project Number:		78030			
	r: Woody		dow.	Contract Number: Sampling Location:		4555C09			
Oil Source and (		/IEW	Collection Date/Time:		Truck Bed @ Plant 9/22/09 @ 12:29 PM				
	D090088		ple ID:	KC-09-1221		HMA Class:			
				· ·		1/2"			
	Gradation (AASH)	10 1 30)		Volun	netrics (AASHT)				
Sieve Size	% Passing	Tolerai *LL	nces *UL	% Va @ Ndes	3.0	*LL 2.5		<b>es</b> <b>*UL</b> 5.5	
1 1/2"		to		% VMA @Ndes	13.8	12.5		N/A	
1"-		to		% VFA @ Ndes	78.3	65	- to	75	
3/4"	100	99 to	100	Dust/Asphalt Ratio	1.3	0.6	- U	1.6	
1/2"	95	90 to	100	Gmm (WSDOT FOP for		2.483	-0	6 lb/ft <sup>3</sup>	
3/8"	83	78 to	90	Gmb (ASTM D		2.409	- 104.	ט וט/ונ	
#4	55	to		Asphalt Content % (KG			-	5.5	
#8	36	35 to	43	% Water (WSDOT FOP	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0.17			
#16	25	to		70 VValer (Wabarra)		0.17		0 max	
#30	18	to		Miv Tomporature in S	·E	242			
#50	12	to	÷	Mix Temperature in °I Oil Temperature in °I		312	-		
#100	9	to		***************************************		330	<u> </u>		
#200	5.9	4.3 to	7.0	Air Temperature in °l		81	-		
#200	0.0	7.0 10	7,0	J *LL=Lower Limit UL	.=Upper Limit				
					opper Littlit				
			Data fro	m Mix Design					
Aggregate S	Source B-333	B-160	0	Gb (Binder)		1.028			
Asphalt Cont	tent Design	5.6%		Mixing Temperature	in °F	313	-		
Anti Strip		0.00%		Compaction Temper	ature in °F	291	-		
Pbe		4.5		Number of Gyrations	@ Initial	8			
Gsb (Aggreg	ate Blend)	2.64		Number of Gyrations	@ Design	100	-		
Gsb (Fine Ag		2.599		ESAL'S (millions)		3	to	<30	
Remarks:	1	VICINIO VEVE	<del></del>	A			-0. 0		
Sample was obtained t	as the 23rd load of the	day. The accumu	lative tonage	on ssmple was taken by Woodwort was 742.58. This is the second of					
Material	meet	s to meet	above s	specifications.		Copies	<b>Dis</b> tribution		
Approved for				Tested and		_1_	Const. Ad		
Distribution By:	Materials Enginee	r	Date	Initial	22/2009 Date		Dens. En	gineer ———	
Form: HMA - To	est Results			Mith	10/7/09	Day	vised: 4/22/0	ng.	



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		igiliuvii ruriia	SAME THE STATE OF THE SECOND S					
Project: SE 410	6th St Overlay, Shin	gles in Paving De	mo.Project N	Number: _	IV	178030		
Contractor:	Woodwort	h & Co.	Contract	Contract Number: C			C004555C09	
Asphalt Supplier	: Woodwor	th Lakesview	Samplin	g Location:	Truc	k Bed @	Plant	
•		U.S. Oil		on Date/Tim		09 @ 12:		
Mix ID: M			C-09-1221	н	MA Class:	1/2		
	Initial	e Content (WSDO After 90 min.		120 min.	929)			
Time	1:51	3:33		1:02	1			
Tare Weight	513.2	513.2		13.2				
Sample + Tare Wt.	1220.4	1219.5		219.2	Mass (Wt.) H <sub>2</sub>	0	1.2	
Sample Weight	707.2	706.3		06.0	Percent H <sub>2</sub> O		0.17	
					1			
M (F t . D		nition Furnace Da					WZI	
Mass of Empty Bas Mass of Baskets ar		3021.7	Ignition Ft	urnace ID:			IKI	
Mass of Sample:	iu Gampie.	4643.7 1622.0	— Actual A	Asphalt Co	ntent in %:	5	5.5	
Calibration Factor (	Ticket) in %:	0.53	Miy Desig	n Asphalt Co	ntent in %:	F	5.6	
Percent Loss (Ticke		6.40		Residual Agg.			44.3	
	ensation (Ticket) in %:	0.18		Residual Agg.			22.6	
	Content (Ticket) in %:	5.69		Residual Agg.		1521.1		
	sses of Residual Aggreg				n: shall be wit			
		Sieve Analysis		30)				
Mass of Dry Washe	ed Residual Aggregate:	1439.5	() U (O) () (	001				
Sieve Size	Accumulative			То	lerance	Contro	l Points	
*Record all sieves		Percent Passing	JMF	Lower		Lower		
Sieve Size	Weight Retained			Limit	Limit	Limit	Limit	
1 1/2"								
1"								
3/4"	0.0	100	100	99	100	100	100	
1/2"	77.3	95	94	90	100	90	100	
3/8"	258.4	83	84	78	90	0	90	
#4	690.6	55	57					
#8	969.4	36	39	35	43	28	58	
#16	1140.1	25	27		177			
#30	1252.9	18	19					
#50 #400	1338.2	12	13					
#100	1393.1	9	8	4.2	7.0	2.0	7.0	
#200	1432.4	5.9	6.3	4.3	7.0	2.0	7.0	
Pan Difference of Massa	1439.5 es - Pan vs. Washed =	0.0% Specific	cation: shall be	within + 0.20	0/.			
Difference of Masse	55 - 1 all V5, VVaSileu -	0.070 Opecino	zation. Snan be	WILLINIT T O.Z	70			
	= Within Tolerance Lin	nits Black Italic -	At Tolerance		Red = Outside <sup>-</sup> dworth. Sample			



Form: HMA - 0.45 Gradation Charl

### KC-09-1221

				Plant in	formation				
Sampling Loc	ation	Truck	Bed @ Plant	Mix Temp	312				
Collection Date	Collection Date/Time 9/22/09 @ 12:29 PM			Oil Temp	330				
Sample ID		КС	-09-1221	_Air Temp	81				
			G	yratory Data	(AASHTO T	312)			
Initial wt. of Un	compac	ted mix.		4800.0					
Height in mm o	f Sample	e @ Initial C	Syrations	127.3	_ 8		Compaction	Temp. =	291
Height in mm of Sample @ Design Gyrations			115.3	100					
			lgr	ition Furnace	(AASHTO	Г 308)			
Mass of Empt	y Baske	et	3021.7	<b>-</b> :-	Percent Lo	ss (Ticket)	in %:	6.40	_
Mass of Bask	et & Saı	mple	4643.7	-9	Temp. Con	np. (Ticket)	in %:	0.18	_ Oil:
Sample Weigh	nt		1622.0	<b>-</b>	Ignition Fu	rnace ID:		TIKI	
Calibration Fa	ctor in	<b>%</b> :	0.53	<b>-</b> ;n	Mass of Re	s. Agg. &	Bask.	4544.3	5.5
			Moisture Co	ntent (WSDC	OT FOP for A	ASHTO T	329)		
Tare Weight		513.2	_	:		Min. test s	ample 500g.		
Sample + Tare	e Wt.	1220.4	Time	1:51	_				
Sample + Tare	e Wt.	1219.5	After 90 min.	3:33	<b>=</b> :				Moist %:
Sample + Tare	e Wt.	1219.2	_After 120 min.	4:02	4:02 (Use Military Time, ex. 00:00)				
				Rice Data (	ASTM D 2041	1)			
						30 mm or	less Hg at 15	min.	
Sample Mass				1547.7	_				
Mass of Pycno	ometer	Under Wa	ter @ 25.0 °C	1277.5	- 1		Min. Mass		RICE:
Pycnometer C	alibrati	<del>on @ 77°</del> F	į.		_	1/2"	1500g		154.6
Mass of Samp	le & Py	cnometer	Under Water	2201.8	_	3/4"	2000g		
Temperature of	of Wate	r 25.0 ± 1.0	) °C	25.1		1"	2500g		
. Sieve	Analysi	s (AASHT	ОТ 30)			В	ılk Specific G	iravity	
Mass of Dry, V	Vashed	Sample	1439.5	-					
1 1/2"		#8	969.4	•	141.1.1.1.1				
1"		#16	1140.1	•8	Weight in A			88.5	
	0.0	#30	1252.9	<b>-</b> 2	Weight in \			03.6	<del></del> x
	77.3	#50	1338.2	-	Weight SS			91.4	-
-	258.4	#100	1393.1	ĕ •°	Temp 25.0	± 1.0 ℃	2	.5.1	<del>-</del>
	90.6	#200	1432.4	<b>-</b> 0					
	Pan	1439.5	<b>→</b> ):						

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#### **HMA Volumetric Worksheet**

Project: SE 416th St Overlay, Shingles in Paving Demo.Project Number: C004555C09 KC-09-1221 **HMA Class:** 1/2" Sample ID: MD090088 Mix ID: **Required Data** 5.5 Percent Binder (Pb) 5.9 % Pass #200 Sieve 2.483 Gmm (Rice Specific Gravity) Compaction Temperature in °F 291 4800.0 Initial Weight of Uncompacted Mixture Number of Gyrations @ Initial 8 100 Number of Gyrations @ Design Gb (Specific Gravity of the Binder) 1.028 Gsb (Bulk Specific Gravity of the Aggregate Blend) 2.64 Theroretical Maximum Specific Gravity "Gmm" (ASTM D 2041) (N) Sample Mass 1547.7 1277.5 (O) Mass of Pycnometer Under Water (P) Pycnometer Calibration @ 77°F (Q) Mass of Sample & Pycnometer Under Water 2201.8 (R) Temperature of Water in °C 25.1 (S) Pycnometer Calibration @ Test Temperature (T) Bitumen Thermal Correction (U) Water Thermal Correction 0.99997 (V) Gmm @ 25°C = N\*U/(N-(Q-O)) 2.483 (W) Density @ 25°C = V\*62.245 lb/ft <sup>3</sup> 154.6 Bulk Specific Gravity "Gmb" (ASTM D2726) A = Mass in Grams of Specimen in Air 4788.5 B = Mass in Grams of Surface-Dry Specimen in Air 4791.4 C = Mass in Grams of Specimen in Water 2803.6 Temperature of the Water °C 25.1 D = Temperature Correction for Density of Water 1.0000 (nearest 0.001) Gmb =D A / (B-C) 2.409 (nearest 0.001) Absorption = ((B-A) / (B-C))\*1000.146% **Gyratory Compactor Data (AASHTO T 312)** H @ Nini (Height of Sample @ Initial Gyrations) 127.3 H @ Ndes (Height of Sample @ Design Gyrations) 115.3 % Gmm @ N ini = (Hdes\*Gmb)/(Hini\*Gmm)\*100 (nearest 0.1) 87.9 % Gmm @ N des = (Gmb)/(Gmm)\*100 (nearest 0.1) 97.0 Air Voids (Va) {WSDOT Std. Spec. 9-03.8(7)} (nearest 0.1) Va = 100 \* (1-(Gmb/Gmm))JMF Tolerance = 2.5% to 5.5% 3.0 Voids in Mineral Aggregate (VMA) {WSDOT Std. Spec. 9-03.8(7)} VMA = 100 \*(1-(Gmb\*Ps/(Gsb\*100))) (nearest 0.1) 13.8 Mix Criteria = Min. 14.0% Voids Filled With Asphalt (VFA) {WSDOT Std. Spec. 9-03.8(7)} VFA = 100 \* [(VMA - Va) / VMA] Mix Criteria = 65 to 75 (nearest 0.1) 78.3 Dust / Asphalt Ratio (D/A) {WSDOT Std. Spec. 9-03.8(2)} (nearest 0.001) Gse = (100 - Pb) / [(100 /Gmm) - (Pb / Gb)] 2.706 Pbe =  $-(P_s*Gb)*(Gse-Gsb)/(Gse*Gsb)+Pb$ (nearest 0.1) 4.6 (nearest 0.1)  $P_{s} = 100 - Pb$ 94.5 D/A = % Passing #200 Sieve / Pbe (nearest 0.1) Mix Criteria = 0.6 to 1.6 1.3



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		Mix Design Ret	uirements a	nd Specifications			
Project: SE 416th S	t Overlay, Sh	ingles in Pavi	ng Demo.	Project Number:	M7	8030	
Contractor:	Woodw	orth & Co.		Contract Number	: C00	4555C09	)
Asphalt Supplier:	Woody	vorth Lakesvie	w	Mix ID: MD090	AMH 8800	Class:	1/2"
Oil Source:	U.	S. Oil		Resident Enginee	r: Fran	k Overt	on
			Gradation				
	(	Contractor JMF			C	ontrol Po	ints
Sieve Size	•	% Passing		Tolerances		Class 1/2	
			*LL	*UL	LL		UL
1 1/2"	******				M		
1"	**************************************				W-15		
3/4"	***************************************	100	99	100	100		100
1/2"		94	90_	100	90		100
3/8"		84		90	0		90
#4		57	52	62			MAC NEWS
#8		39	35	43	28		58
#16		27					
#30		19					
#50		13					
#100		8					
#200		6.3	4.3	7.0	2.0		7.0
Aggregate Source (F	Pit #)	B-333	B-160				
Binder Grade (PG)		64-22	ESAL	'S (millions)	3	to	<30
% Asphalt Content D	Design	5.6	•••••		5.1%	_ to	6.1%
% Anti Strip		0.00					
% Water							2% max
% Va @ Ndes	С	3.7			2.5	_ to	5.5
% VMA @Ndes	<u>C</u>	14.3			14	_ to	N/A
% VFA @ Ndes	С	74			65	_ to	75
Dust/Asphalt Ratio	<u>C</u>	1.4	•••••		0.6	_ to	1.6
Pbe	<u>C</u>	4.5					
Gmm	S	2.463		pecification			45
Gmb	S	2.374	Fracti	ure	Single face		90%
					Double face		<del></del>
Gsb (Aggregate Bler		2.640	Fine /	Aggregate Angularity			44% min.
Gsb (Fine Aggregate		2.599			3		
Gb (Binder)	S	1.028					
Mixing Temperature		313					
Max. Mixing Temper		350					
Compaction Temper		291			_	opies Dis	stribution
Number of Gyrations	@ Initial	88			C	ohies Di	ווטענוטוו

\*LL=Lower Limit

**UL=Upper Limit** 

**C** = Use Contractors Information

100

160

S = Use WSDOT Information

Number of Gyrations @ Design

Number of Gyrations @ Max.

Resident Engr.

Const. Admin.



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HMA Mineral Aggregate Results

·			lyyrcyale nesults		
Project:	SE 416th St Ove		_Project Number:		M78030
Contractor:	Woodwortl		_Contract Number	r: ,	C00455C09
Name of Source:	Miles Sand and G	iravel Roy Pit	_Sampling Location	on:	Plant/Belt
Lab Sample Number:	KC-0	9-1218	Collection Date:		9/22/2009 @ Morning
Mix ID: MD09008	88 Pit #:	<b>B-333</b> S	ampled By:	TEP H	MA Class:1/2"
	Sai	nd Equivalent 7	Test (AASHTO	T-176)	
SE Value=	Sand Reading (*	100)	Clay Reading	Sand Read	ing SE Value
	Clay Reading		5.5	3.5	64
			Specification =	45 Mi	n.
	Percentage of	Fracture in Co	urse Aggregate	(AASHTO	TP-61)
D = Doront of f					
P = Percent of f			s of questionable p		orderline particles
F = Mass of frac	Ė.		s of unfractured pa		
F/ /- 0\7	Sieve Size	F	Q	N N	P
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right  *$	3/4"			-	
$P = \left  \frac{(Y - Y)}{F + Q + N} \right ^*$	1/2"	103.5	0.0	0.0	100
	3/8"	160.4	1	2.4	100
1.00			0.0		<b>+</b>
C ifi	#4	77.5		1.1	99
Specific		le Face = 90 %	Double Fac		
	Uncompacted \	oid Content of	Fine Aggregat	e (AASHTO	T-304)
V = Volume of o	cylindrical measure,	ml	G = Bulk	dry specific g	ravity fine agg. (G₅)
F = Net mass, g	, of fine aggregate	in measure	U = Unco	ompacted void	ds, percent, in the material
Preparation o	f Test Sample	e <u></u> 30	<u> </u>		$\lceil \nu_{-}(F/) \rceil$
Sieve Size	Mass	Tare	185.	64	$J = \left[\frac{V - \left(\frac{F}{G}\right)}{V}\right] * 100$
#8 - #16	44 +/- 0.2 g	·			L - J
#16 - #30	57 +/- 0.2 g	V	F	G	U
#30 - #50	72 +/- 0.2 g	100.0	138.56	2.599	46.7
#50 - #100	17 +/- 0.2 g	100.0	137.92	2.599	46.9
Specificat	ion 44 Min.		.f41	Average	e 47
Remarks:					
				9	
	X meets				
Material		-	pecifications.		Copies Distribution
<del></del>	fails to mee	et			2 Resident Engr.
Approved for		т	ested and		1 Const. Admin.
Distribution By:			submitted by:LKW_	9/24/2009	
	Materials Engineer	Date	Initial	Date	



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**HMA Mineral Aggregate Results** 

			nma millicial A	AALEAGIE VE2NIC	3		
Project:	SE	416th St Overla	ay	Project Number		M78030	
Contractor:		Woodworth		Contract Number	er:	C00455C09	
Name of Source:	Mile	s Sand and Gra	vel Roy Pit	Sampling Locati	ion:	Plant/Belt	
Lab Sample Numb	er:	KC-09-	1222	Collection Date:		9/22/2009 @ At	ternoon
Mix ID: MD090	8800	Pit #:	<b>3-333</b> Sa	ampled By:	TEPH	HMA Class:	1/2"
		Sand	Equivalent T	est (AASHTO	T-176)		
SE Value	e= Sa	and Reading (100	2)	Clay Reading	Sand Rea	ding   SE Value	
OE Value		Clay Reading	<u>- 7</u>	5.8	3.6	63	
		19		Specification =	45 M	lin.	
	Per	rcentage of Fr	acture in Cou	ırse Aggregat	e (AASHTO	TP-61)	
2 2 4							
P = Percent					-	orderline particle	S
F = Mass of t	ractured			of unfractured p			٦
F2	-	Sieve Size	F	Q	N	Р	-
$\left  \left( F + \left( \frac{Q}{2} \right) \right) \right $		1"					5
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right $	*100	3/4"	02.0	0.0	2.5	96	-
1 + 2 + N		1/2"	83.0	0.0	3.5 15.3	95	
	_	3/8"	279.4	0.0	0.0	100	-
0	161 41	#4	50.0	Double Fa		100	J
Spec	ification	<u> </u>	Face = 90 %				
	Unc	ompacted Vo	id Content of	Fine Aggrega	ite (AASHT	O T-304)	
V = Volume	of cylind	rical measure, m	ī	G = Bul	k dry specific	gravity fine agg.	(G <sub>b</sub> )
		ne aggregate in		U = Und	compacted vo	ids, percent, in th	e material
Preparation						$\lceil v \mid (F/) \rceil$	
Sieve Siz		Mass	Tare	185	5.64	$U = \left\lceil \frac{V - \left(\frac{F}{G}\right)}{V} \right\rceil * 10$	00
#8 - #16		44 +/- 0.2 g				L ' J	
#16 - #30	)	57 +/- 0.2 g	V	F	G	U	
#30 - #50	)	72 +/- 0.2 g	100.0	138.22	2.599	46.8	
#50 - #10	0	17 +/- 0.2 g	100.0	138.78	2.599	46.6	_
Specifi	cation	44 Min.			Avera	ge <u>47</u>	
Remarks:							
_	X	meets					
Material		e 11 .	above sp	pecifications.		Copies	Distribution
_		_fails to meet				2	Resident Engr.
Approved for		.2		ested and		1	Const. Admin.
Distribution By:			s	ubmitted by:LKV	V 9/24/2009		
	Materia	als Engineer	Date	Initia	al Date	=	



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859 Mix I.D. 2635.0 ft3 Enumciaw ACP 1	Min	Troxler 4640B #2659 Mi	Troxler 4640B #2659   Mis   Subjot Size   200 Tons     Loc.   Enumclaw	Gauge         Troxler 4640B #2659         Mi           0.17ft         Subiot Size         200 Tons         Loc.         Enumclaw	92         Gauge         Troxler 4640B #2659         Mi           D) =         0.17ft         Subiol Size         200 Tons	Air Temp.         92         Gauge         Troxler 4640B #2659         Mix           Depth (D) =         0.17ft         Sublot Size         200 Tons	End Air Temp.   92   Gauge   Troxler 4640B #2659   Mis   13ft   Depth (D) =   0.17ft   Subid Size   200 Tons	50         End Air Temp.         92         Gauge         Troxler 4640B #2659         Mis           V) =         13ft         Depth (D) =         0.17ft         Subfor Size (S)         200 Tons	50 End Air Temp. 92 Gauge Troxler 4640B #2659 Mis  V) = 13ft   Depth (D) = 0.17ft   Subiot Size 200 Tons   Control of the cont	Start Air Temp.   50   End Air Temp.   92   Gauge     Troxler 4640B #2659   Mis   Alberta	Wearing         Start Air Temp         50         End Air Temp         92         Gauge         Troxler 4640B #2659         Mi           0.0759 Tonsift3         Width (W) =         13ft         Depth (D) =         0.17ft         Subject Size         200 Tons         Loc.         Enumelaw           05+85         Subject Ln. [(A) x 0.2] = (L)         238ft         Sia. to Sta.         Loc.         Enumelaw	50         End Air Temp.         92         Gauge         Troxler 4640B #2659         Mi.           V) =         13ft         Depth (D) =         0.17ft         Subfort Size (S)         200 Tons         Alian
Enumclaw		200 Tons	200 Tons   Loc.	Subjot Size 200 Tons (S) Loc.	$h(D) = \begin{vmatrix} 0.17\text{ft} & \text{SUDIOT SIZE} \\ \text{(S)} & \text{200 Tons} \end{vmatrix}$	Depth (D) =   0.17ft   SUDIOI SIZE  (S)	13ft Depth $(D) = 0.17$ ft Subiol Size $(S)$	13ft   Depth (D) = $  0.17ft   Subiot Size  $ (S)	Width $(W) = 13$ ft Depth $(D) = 0.17$ ft Subiol Size 200 Tons $(S)$	759 Tonsift3   Width (W) =   13ft   Depth (D) =   0.17ft   Subject Size   200 Tons   Country of the Country of	0.0759 Tons/ft3         Width (W) =         13ft         Depth (D) =         0.17ft         Subject Size         200 Tons           05+85         Subject Ln. $\{(A) \times 0.2\} = (L)$ 238ft         Sta. to Sta.         Loc.         Loc.	0.0759 Tons/R3 Width $(W) = \begin{vmatrix} 13R & Depth(D) = 0.17R & SUDIOT SIZE \\ (S) \end{vmatrix}$
	Formedaw		Loc. Enumclaw	Loc. Enumclaw	Sta to Sta				2286   Cto 1/ Cto	Subjet 1 (A) v 031-111 33000 CV 10 CV	Sublot Ln. [(A) x 0.2] = (L) 238ft Sta. to Sta.	
		Enumclaw			Ota: to ota:	Sta. to Sta. Loc.	238ft Sta. to Sta.	238ft Sta. to Sta. Enumciaw	Con Cola.	Subset 21: [27] A U. 2] - [L] ASSET   Std. 10 Std.   LDC.		Sta. to Sta.
Readings Avg. Corr. Fact.		Gauge Readings Avg.	Depth Gauge Readings Reading	Gauge Readings Avg.	Depth Gauge Readings Avg.	Offset Depth Gauge Readings Avg.	Offset Depth Gauge Readings Avg.	Depth Gauge Readings Avg.	Offset Depth Gauge Readings Avg.	Offset Depth Gauge Readings Avg.	Test Location Offset Depth Gauge Readings Avg.	Offset Depth Gauge Readings Avg.
		145.3 144.0	0.17 145.3 144.0	0.17 145.3 144.0	0.17 145.3 144.0	4'RT 0.17 145.3 144.0	4'RT 0.17 145.3 144.0	4'RT 0.17 145.3 144.0	4'RT 0.17 145.3 144.0	4'RT 0.17 145.3 144.0	115+45 4-RT 0.17 145.3 144.0	115+45 4-RT 0.17 145.3 144.0
145.5		144.8	0.17 144.8	0.17 144.8	0.17 144.8	0.17 144.8	6'RT 0.17 144.8	6'RT 0.17 144.8	6'RT 0.17 144.8	6'RT 0.17 144.8	113+25 6°RT 0.17 144.8	113+25 6'RT 0.17 144.8
146.5	+	446	0.17	0.17	0.17	0.17	00111	0 F151 0 11 444.6	2 5 10 TO TO TAKE	ο ποτο σ το σ το σ το σ το σ το σ το σ τ	440450 PEDT 0.47 4448	440450 PEDT 0.47 4448
146.5		444.0	2777	0.47	0.47	444.0	C TTT PTC PCIEC	0 5:01	8 5'BT 0.17 144 6	8 5°DT 0.47 144.6	440+50 PEDT 047 444.6	440+50 PEDT 047 444.6
145.5	-	144.8	0.17 144.8	0.17 144.8	0.17 144.8	0.17 144.8	6RT 0.17 144.8	6RT 0.17 144.8	6RT 0.17 144.8	6RT 0.17 144.8	113+25 6FRT 0.17 144.8	113+25 6FRT 0.17 144.8
	- 1 1 1	144.8	Depth 145.3 0.17 144.8	Depth 145.3 0.17 144.8	Offset Depth 4'RT 0.17 145.3 6'RT 0.17 144.8	Offset Depth 4'RT 0.17 145.3 6'RT 0.17 144.8	tion Offset Depth 4'RT 0.17 145.3 6'RT 0.17 144.8	tion Offset Depth 4'RT 0.17 145.3 6'RT 0.17 144.8	tion Offset Depth 4'RT 0.17 145.3 6'RT 0.17 144.8	Test Location Offset Depth 115+45 4'RT 0.17 145.3 113+25 6'RT 0.17 144.8	Test Location Offset Depth 115+45 4'RT 0.17 145.3 113+25 6'RT 0.17 144.8	Test Location Offset Depth 115+45 4'RT 0.17 145.3 113+25 6'RT 0.17 144.8

				9											Lot Avg.	_	94.2
Est	Estimated Density (p) =		Tons/ft3	0.0759 Tons/ft3   Width (W) =	13ft	Depth (D) =	. 0.17ft	ezis joigns (S)	Size	200 Tons	Vol. of ACP	Vol. of ACP in Sublot $(V) = (S)/(p) =$	2635.0 ft3		Lot Length to nearest $100 \text{ (A)}$ = $V(H^3) / W(H) \times O(H)$ =	1 100 (A)	1190ft
Beg	Beg. Sta. 102+90 + 92+50	92+50	Sublot Li	Sublot Ln. $[(A) \times 0.2] = (L)$	(7)	238ft :	Sta. to Sta.			T	7oc.	Enumclaw	4	ACP Test Temp.	.dı	# 107	2
Test	Location Code	- de					0	Offset	Depth	Ga	Gauge Readings	S	Avg. Reading	Corr. Fact.	Corrected	Rice Density	% of Rice
्या	Section #4	_		102+90	96-		3	3.5'RT	0.17	142.5	142.5		142.5	1.007	143.5	154.6	92.8
7	Section #4	_		100+00	-00		2	2.5'RT	0.17	143.1	142.5		142.8	1.007	143.8	154.6	93.0
က	Section #4			09+46	09		9	6.5'RT	0.17	145.4	144.4		144.9	1.007	145.9	154.6	94.4
4	Section #4	_		95+05	05		10	10.5'RT	0.17	144.1	144.2		144.2	1.007	145.2	154.6	93.9
က	Section #4			92+50	20			3'RT	0.17	142.4	142.8		142.6	1.007	143.6	154.6	92.9
G1 5	Field test	s performer	d using KC	Field tests performed using KCDOT Test Method N-1.	hod N-1.										Lot Avg.	_	93.4

Pavers: Blaw Knox PF-5510 #711	Rollers
Remarks: Woodworth paved section #4 on the plan sheet. They planned to do 950 tons plus a smaller amount	
of prelevel for the paving to be done on 9-23-09. The asphalt placed today had 15% RAP and 0% RAS.	
	Passes
	Roller Co

4 Vibe

4 Vibe

DDV Double Drum Vibrator

Intermediate IR 110 HF

Breakdown Sakal GW 750 DDV

TS - Tandem Steel

Tester informed paving contractor and K.C. Inspector of the day's test results.

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

9-22-09 RAP Lots 1 & 2

King County
Hot Mix Asphalt Compaction Form

155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

	Date	9/22/09	Project		416th	416th RAS Study	dy	No.			Section	nc nc		Prime	Woodworth	h Paving Co.	co. Woodworth	rth Plant	Lakeview
Class	-	1/2" Lift	Wearing	Wearing Start Air Temp.	ir Temp.	50 E	End Air Temp.	np. 92	Gauge			Troxler 4640B #2659	3 #2659		Mix I.D.	Ē	MD090088	Rand.	#
Esti	mated I	Estimated Density (p) =	0.0759 T	0.0759 Tons/ft3	Width (W) =		13ft Dep	Depth (D) =	0.17ft	Subiol Size	Size	200 Tons			2635.0 ft3		Lot Length to nearest $100^{\circ}(A)$ = $V(R^3) / W(R) \times D(R)$ =	St 100 (A)	1190ft
Beg. Sta.	Sta.	+		Sublot Lr	Sublot Ln. $[(A) \times 0.2] = (L)$	2] = (L)	238ft		Sta. to Sta.			7	70c.	Enumclaw		ACP Test Temp.	.dı	# 107	m
Test		Location Code			Te	Test Location	Ę			Offset	Depth	Ga	Gauge Readings	<u> </u>	Avg. Reading	Corr. Fact.	Corrected	Rice Density	% of Rice
-		Section #4				91+30				7. RT	0.17	144.5	146.5		145.5	1.007	146.5	154.6	94.8
2		Section #4				115+60				9.5° LT	0.17	143.7	144.1		143.9	1.007	144.9	154.6	93.7
က	, <u> </u>	Section #4				113+00				4. LT	0.17	142.7	142.4		142.6	1.007	143.5	154.6	92.9
4		Section #4				110+90				6' LT	0.17	144.9	143.4		144.2	1.007	145.2	154.6	93.9
2		Section #4				108+40				9. LT	0.17	141.1	140.6		140.9	1.007	141.8	154.6	91.7
										30000000							Lot Avg.	, in	93.4
Estir	nated I	Estimated Density (p) =	0.0759 1	0.0759 Tons/ft3	Width (W) =		13ft Dep	Depth (D) =	0.17ft	Subior Size	l Size	200 Tons	Vol. of ACP	Vol. of ACP in Sublot (V) = (S)/(p) =	2635.0 ft3		Lot Length to nearest $100^{\circ}(A)$ = $V(H^3) / W(H) \times D(H)$ =	St 700" (A)	1190ft
Beg. Sta.	-	102+90 + 92+50	2+50	Subjet Lr	Sublot Ln. $[(A) \times 0.2] = (L)$	2] = (L)	238ft		Sta. to Sta.			T	7oc.	Enumclaw		ACP Test Temp.	.dı	# 107	4
Test		Location Code								Offset	Depth	Ga	Gauge Readings	<u>s</u>	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice	% of Rice
-		Section #4				106+10				3. LT	0.17	141.8	143.7		142.8	1.007	143.7	154.6	93.0
7		Section #4				103+35				6' LT	0.17	141.5	143.1		142.3	1.007	143.3	154.6	92.7
ო		Section #4				100+65				8.5' LT	0.17	145.7	145.0		145.4	1.007	146.4	154.6	7.76
4		Section #4				98+75				6.5' LT	0.17	144.7	142.0	12	143.4	1.007	144.4	154.6	93.4

Pavers:	Pavers: Blaw Knox PF-5510 #711	Rollers
Remarks:	Remarks: Woodworth paved the westbound lane which is test section #4 on the plan sheet. They planned to do	
950 tons p	950 tons plus a small amount of prelevel for the paving to be done on 9-23-09. The asphait placed today had	
15% RAP 8	15% RAP and 0% RAS.	
		Passes
		Roller Code

	P-Pneumatic
2-3 Static	SDV - Single Drum Vibrator
	SDV - Single
	Roller Codes:
	2-3 Static

TS - Tandem Steel

DDV Double Drum Vibrator

93.4

154.6

144.5

1.007

143.5

142.9

144.0

0.17

5' LT

96+50

Section #4

S

Field tests performed using KCDOT Test Method N-1.

93.4

Lot Avg.

IR 110 HF

Breakdown Sakai GW 750 DDV

۵

Tester informed paving contractor and K.C. Inspector of the day's test results.

Date 9/28/2009

Joe Karahuta

Field Eng./Tester



155 Monroe Avenue NE, Bidg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

Class   117	ã	Date 9/2	9/22/09	Project		416th RAS Study	AS Stud	^	No.			Section	-		_	Prime   \	Woodworth	th   Paving Co.		Woodworth	Plant	Lakevlew
Section #4   Subfort In [A) A C 2   E 1   Subfort   D   E   A C 2   E 1   Subfort   D   E   A C 2   E 1   Subfort   D   E   A C 2   E 1   A	ğ	-	Trill	Wearing				1 Air Temp	92	Gauge		1	roxler 464	)B #2659			Mix I.D.		MD090088		Rand. #	
	i ž	afed Densit	y (p) =	0.0759 To		Vidth (W) =				0.17ft	Subjor (S)	Size	200 Tons				2635.0		t  Length to  n = $V(R^3) / W_0$	earest 100 (ft) x D(ft ):	(w)	1190ft
	ارة	Sta.	+		Sublot Ln.	$I(A) \times 0.2I$	(7) = (	238ft	Sfa.	to Sta.				Loc.	Ē	umclaw	A	CP Test Te	.dw	7	# J07	e.
Section #4   Sec	76	Locatio	n Code			Test	Location			₹		Depth		Sauge Rea	dings		Avg. Reading				Rice Density	% of Rice
Section #4   Section #4   143.6   143.6   143.6   143.6   143.1   140.7   141.0		Secti	on #4			ð	4+15			7.5		0.17	144.0	143.1			143.6	1.007	144.		154.6	93.5
Section #4   Section   Section #4   Section	-	Secti	on #4			6	2+05			.4		0.17	142.5	143.6			143.1	1.007	144.		154.6	93.2
Lot Avg.   Subfot Lt.		Secti	on #4			)6	0+10			å		0.17	145.3	146.6			146.0	1.007	147.		154.6	95.1
Location Code    Sublot Ln.	-																					
Total   Tota																						
	1																		Fol	Avg.		93.9
Sta   Sta   Sta   Depth   Depth   Sta   Depth   Sta   Depth   Sta   Depth   Sta   Depth   Depth   Sta   Depth   Sta   Depth   Depth   Sta   Depth   Depth	1 :	nated Densit	y (p) =	0.0759 Te		Vidth (W) =		Depth.	= (a) 4		Sublot (S)	Size		Vol. of	ACP in St (S)/(p) =	nb/ot (V) =		07	$\epsilon Length to n = V/R^3 / W_0$	earest 100 (ft) x D(ft ):	(A) =	
Location Code	اه	Sfa.	+		Sublot Ln.	[(A) × 0.2]	(7) = 1	238ft		to Sta.				70c.			A	ICP Test Te	тр.	7	Tot #	
Roller   Passes   A Vibe   Passes   A Vibe   Passes   Passet   P	70	Locatio	n Code						1	₽		Depth	Ü	3auge Rea	dings		Avg. Reading				Rice Density	% of Rice
Roller Sphalt placed today had	$\vdash$																					
Roller Shall planned to do																						
Rollers   Breakdown   Intermediate																						
the plan sheet. They planned to do  The asphalt placed today had  The asphalt placed today had  Passes  A Vibe  2-3 Static  Roller Codes: SDV - Single Drum Vibrator DDV Double Drum Vibrator DDV Double Drum Vibrator						-																
Rollers Breakdown Intermediate Sakal GW 750 R 110 HF Brashalt placed today had Passes 4 Vibe 2-3 Static Roller Codes: SDV - Single Drum Vibrator DDV Double Drum Vibrator DDV Double Drum Vibrator DDV Double Drum Vibrator	_									_										-		
The asphalt placed today had  The asphalt placed today had  The asphalt placed today had  Passes  4 Vibe  2-3 Static  Roller Codes: SDV - Single Drum Vibrator  DDV Double Drum Vibrator		FIBL	d tests pe	rformed t	using KCD	OT Test A	fethod h	<u>k-1.</u>							3				P	t Avg.		
The asphalt placed today had  The asphalt placed today had  Passes  4 Vibe  2-3 Static  Roller Codes: SDV - Single Drum Vibrator  DDV Double Drum Vibrator	ارة ا		V Knox PF	5510 #7	11										ď	ollers	Breakd	own	Intermed	Hate		
The asphalt placed today had  Passes  4 Vibe  2-3 Startic  Roller Codes: SDV - Single Drum Vibrator  DDV Double Drum Vibrator	e	arks: Woo	dworth p	aved the	westbound	d lane whi	ch is te	st section	#4 on th	e plan sh	eet. The	y plann	ed to do				Sakal GV	v 750	IR 110	生		
Passes 4 Vibe 4 Vibe 2-3 Static Paving contractor and K.C. Inspector of the dav's test results.	=======================================	ons plus a s	mall amo	ount of pre	elevel for t	the paving	to be d	one on 9-	23-09. Th	ie asphal	t placed	today	par				<u>~</u>		Add			
Adav's test results.  2-3 Static  Roller Codes: SDV - Single Drum Vibrator  DDV Double Drum Vibrator	<u>«</u>	RAP and 0%	RAS.												R	sess	4 VIb	•	4 VIbe			
Roller Codes: SDV - Single Drum Vibrator and Stresults.															_				2-3 Sta	ţ		
dav's test results.	1														<del>"</del>	oller Co		/ - Single Di	rum Vibrat	<b>5</b>	P-Pn	P-Pneumatic
	ا ا	ster infor	med pa	vina co	ntractor	and K.C.		ector of	the day	's test	results	ا ا			r		00	/ Double Dr	um Vibrato		TS - Tandem Steel	n Steel

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

### SE 416<sup>th</sup> Street Overlay: Shingles in Paving Demonstration

### **Construction Inspection and Quality Control Testing**

Paving Day 2 (9-23-09)

Inspectors Daily Report
HMA Test Results
HMA Mineral Aggregate Test Results
HMA Compaction Test Results

### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

### **INSPECTORS DAILY REPORT Page 1 of 2**

DATE: Wednesday September 23rd 2009

Federal Aid #

Pink - Inspector's Diary

INSPECTOR (S):	S.Shandi	il, M.Pavolka	2	CONTRACTOR:	Woodworth & Con	npany
WEATHER:		 ear		-	TEMP: High 80	Low60
-	foderate X	High			Workable 8	Nonworkable ()
SIGNS AND TRAFFIC CON	30 <u>———</u> 1	Yes X	No		On-Site Interview? Yes	
WORK DONE:	IROL CHECKED:	1 C3 X			ON-BITE INVERVIEW. 165	X
63+10 at 228th paver. Al opera 110HF as inter for 2hrs, mob. paving at 1.40 2.15pm.Contin	n ave. Mob. Equip ating Blaw Knox p mediate/finish ro Equipment back t pm, had about 25	oment. 7.30 be naver with Jon ller and the Di to 236th.Place 5tons mix in s tion. Placed to	egin paving from nathan as screed D-28HF for side s e water to drop m huttle buggy. Pre emp tapes, place	st # 89+66 to 63+10 operator. Shane us streets d/ways.9.20 at temp. on the Nor level North and So	tack on North side of SE 416th fi D. Luke operating shuttle buggy to ing Sakai as b/down roller with End paving at st# 63+10, place th side. 11.30 pave South side u uth side of road to cover county temp. Road opened at 3.30pm.F	to transfer mix on to Willie operating DL paper joint. Waited up to st#63+10 End prep. Work. End at
	e: (Grinding): C					
EQUIPMENT ON PR						
1262),1 Back I	Hoe( JD 510 # 20 # 810,Sakai GW	03),1- Shuttle	Buggy (SB- 250	0B # 715), 1- Pave	# 38) 1 – Flagging truck( Chevy r( Blaw Knox # 711), 3 Rollers( ruck # 26, Peter Bilt Tack Truck	I.R DD-28HF # 84
	L ON PROJEC	T:				
operator ( Luke spotter ( Dave • Gloria Jeanne	e Dillard), I – Scre Thorton), 1 – Rai :	eed operator ( ker ( Ludvig Y	Jonathan Pullaci efimov ),1 – Tack	k), 2 – Roller operat c Operator ( ), 1- T	Paver operators( Al Anderson), 1 tors ( Shane Thomas, Willie Guil CS ( Tara), 4- Flaggers( Glen, k Beatty (DNR),Michelle Caulfield(	llen), 1- Truck Katy, Ray and Paula
				r), Herb( WSDOT)	beauty (bitty, monene edament)	Oonounani)
	•					
REMARKS: - Road closed by from 7am to 5p		ve and 2000' i	East of 212th ave	. Flaggers at each	major crossing to stop cars ente	ring in to work zone
	break down rolle	r on 6 vibes, l	DD-110 as interm	ediate roller on 4 v	ibes, 2 static rolling pattern and i	DD-28 for Side
	e North side from				Was in the mid 80deg.  and South side from st # 63+00	) to 54+00 (0"at

INSPECTOR'S SIGNATURE:

#### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

### **INSPECTORS DAILY REPORT Page 2 of 2**

DATE: Wednesday September 23rd 2009

- Day 2 Paving was from station 89+66 to 63+10. Wood Worth haul mix from Lake View plant using 15 truck and trailers. Placed 933.85
  Tons of HMA Class ½" PG 64-22 with 15% Rap and 3% RAS on Se 416th st at 2" compacted. Placed 25 T of same mix as prelevel on
  SE 416TH ST.
- All trucks came in with covered loads.
- Temp. Of mix was 270 deg at 89+66, 285deg at 83+50,295deg at 75+50,300 deg at 72+00. Temperature stayed within 5 deg. of 295deg. For rest of day.
- Talk to school principle at Elementary School. Discussed on school schedule and advised principle that we will adjust work hours. Contractor would start paving at 8am on Friday so that we are no way near school zone. Road will be closed from 212th to 236th but access will be given to school bus, parents and teachers.
- Call from Tara (lab) that 1st mix sample failed. # 200 was 7.2% and oil was 6.3. Advised f/man. Second sample failed also. #200 was at 6.8% and oil was 6.2. This could be the reason for easy compaction.
- Call from Kevin (lab) that King County and Wood worth have decided to pave the day 4 sections( st 36+50 to 10+17) on 09/24/09 using HMA plus 15% RAP. This would give Wood worth time to find out why mix sampled for today failed. Day 3 section ( st 63+10 to 36+50)will now be paved on 09/25/09.
- Placed only 1" compacted mix on bridge crossing. It was rolled in static mode.
- WSDOT core crew on site with Joe (LAB) to core mix that was placed on Day 1( Mix had 15% RAP).

	Inspector(s) Time:	
White - Contract File		
Yellow - Project Engineer Pink - Inspector's Diary	Inspector's Signature:	



155 Monroe Avenue NE, Bldg D. Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

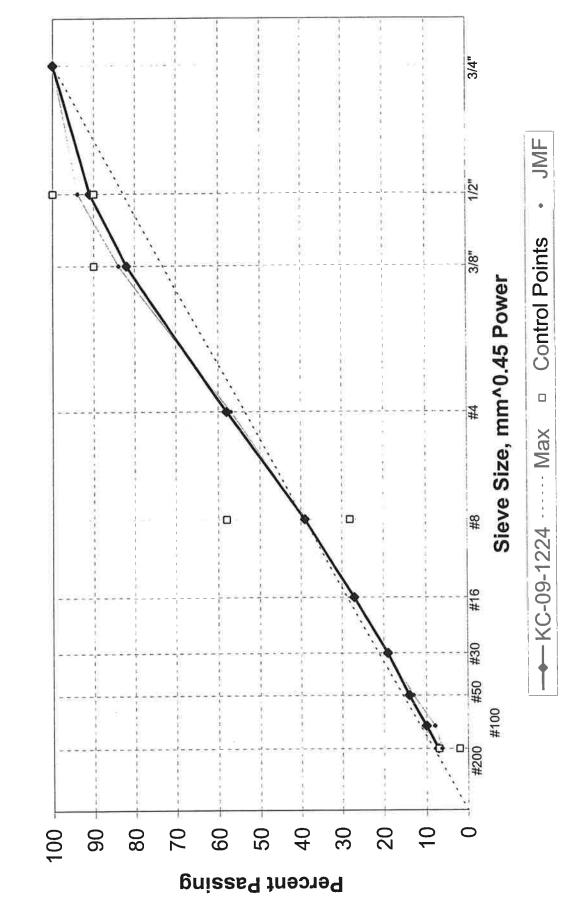
				HMA	<u> </u>				
Project: SE 416	6th St Overlay, S	hingles i	n Pav	ing Den	no. Project Number:		78030		
Contractor: Woodworth & Co.					Contract Number:	C004555C09			
		worth Lakesview			Sampling Location:				
Oil Source and	Grade:	U.S.	Oil		Collection Date/Time:		09 @ 7:3	35 AM	
Mix ID: M	D090088		Samp	le ID:	KC-09-1224	HMA Class	3:	1/2"	
	Gradation (AASH)	TO T 30)			Volum	etrics (AASHT)	O T 312)		
							Tolera		
Sieve Size	% Passing		lerano		0/ V/- @ Nides	4.4	* <b>L</b> L	4	*UL
		*LL		*UL	% Va @ Ndes	1.1	2.5	- to -	5.5
1 1/2"			to		% VMA @Ndes	14.1	12.5	- <sup>to</sup> –	N/A
1"			to		% VFA @ Ndes		65	to –	75
3/4"	100	99	to	100	Dust/Asphalt Ratio	1.3	0.6	- to _	1.6
1/2"	91	90	to	100	Gmm (WSDOT FOP for		2.450	15	2.5 lb/ft <sup>3</sup>
3/8"	82	78	to	90	Gmb (ASTM D		2.423	ē.	
#4	58		to		Asphalt Content % (KC				6.4
#8	39	35	to	43	% Water (WSDOT FOP to	or AASHTO T 329)	0.18		2.0 max
#16	27		to		1				
#30	19		to		Mix Temperature in °	F	329	_	
#50	14		to		Oil Temperature in °F	-	330		
#100	10		to		Air Temperature in °F	=	57		
#200	7.2	4.3	to	7.0					
					*LL=Lower Limit UL	=Upper Limit			
				Data fro	om Mix Design				
	0 000		100	0	Ch (Rindor)		1.028		
Aggregate			160	0	Gb (Binder)	in °E	313	20	
	tent Design		5.6%	_	Mixing Temperature		291	23	
Anti Strip			0.00%	_	Compaction Tempera		8	-	
Pbe			4.5	<del></del>	Number of Gyrations			-	
Gsb (Aggre	- Aller Aller		2.64	#	Number of Gyrations	@ Design	100	- 4-	100
Gsb (Fine A	.ggregate)		2.599	_	ESAL'S (millions)		3	to _	<30
Remarks:									
ticket #245004. This contains 15% RAP ar thing as MD090088, h	truck was the 12th load nd 3% RAS. Note: Yes ne agreed to change it o	of the day. Sterday, the ti on the tickets	The accickets d	cumulative t isplayed MI ow on. Igni	ion sample was taken by Woodwork conage was 386.01. This is the first 2090057, I questioned the Plant Op tion Furnace Calibration Factor Cha or oil content% and the #200 screen	of two samples to be erator about this and inged from 0.63 to 0	e taken toda d he stated tl	ay. This	mix
							(40)		
							io.		
	mee	ts					1		
Material				above	specifications.		Copies	Distri	ibution
	Xfails	to mee	t				2		lent Engr.
Approved for					Tested and Submitted by: TEP 9/	23/2009			t. Admin. . Engineer
Distribution By:					-			DCI10.	Ligilica
	Materials Engine	eer		Date	Initial	Date	-		
					Victor y	Wat			
					1,000	10/4/09			
Form: HMA -	Test Results					6	Re	evised: 4	/22/08



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709

Fax: (206) 296-0179

Project: SE 416th St Overlay, Shingles in Paving DemoProject Number: M78030 Woodworth & Co. Contract Number: C004555C09 Contractor: **Woodworth Lakesview** Sampling Location: Truck Bed @ Plant Asphalt Supplier: Collection Date/Time: 9/23/09 @ 7:35 AM U.S. Oil Oil Source and Grade: KC-09-1224 HMA Class: 1/2" MD090088 Sample ID: Mix ID: **Moisture Content (WSDOT FOP for AASHTO T329)** After 120 min. After 90 min. Initial 11:10 8:46 10:40 Time 512.0 512.0 512.0 Tare Weight Mass (Wt.) H<sub>2</sub>O 1175.4 1176.6 1175.6 1.2 Sample + Tare Wt. 663.4 Percent H<sub>2</sub>O Sample Weight 664.6 663.6 0.18 Ignition Furnace Data (AASHTO T 308) 3010.1 Ignition Furnace ID: TIKI Mass of Empty Basket(s): Mass of Baskets and Sample: 4867.9 Actual Asphalt Content in %: 6.4 Mass of Sample: 1857.8 Mix Design Asphalt Content in %: 5.6 Calibration Factor (Ticket) in %: 0.53 7.32 Mass of Residual Agg. & Basket: 4734.2 Percent Loss (Ticket) in %: 0.16 Mass of Residual Agg. (Direct): 1724.1 Temperature Compensation (Ticket) in %: Mass of Residual Agg. (Ticket): 1724.8 6.63 Calibrated Asphalt Content (Ticket) in %: Difference of Masses of Residual Aggregate - Direct vs. Ticket = 0.0% Specification: shall be within ±0.1%. Sieve Analysis (AASHTO T30) 1613.1 Mass of Dry Washed Residual Aggregate: Tolerance Accumulative Control Points Sieve Size **JMF** Percent Passing Upper Upper \*Record all sieves Lower Lower Weight Retained Limit Limit Limit Limit Sieve Size 1 1/2" 1" 100 99 100 100 100 0.0 100 3/4" 94 90 100 90 149.0 91 100 1/2" 84 78 90 0 90 302.4 82 3/8" 57 58 730.9 #4 39 39 35 43 28 58 #8 1050.9 27 27 1259.0 #16 19 #30 1394.5 19 14 13 1487.9 #50 10 8 #100 1551.2 7.0 #200 1600.1 7.2 6.3 4.3 2.0 7.0 1612.9 Pan 0.0% Specification: shall be within ± 0.2% Difference of Masses - Pan vs. Washed = Red = Outside Tolerance Limit Black Italic - At Tolerance Limit **Bold = Within Tolerance Limits** Sample was obtained by King County Representative Tara Pfaff. A companion sample was taken by Woodworth. Sample was obtained from truck #10069T, ticket #245004. This truck was the 12th load of the day. The accumulative tonage was 386.01. This is the first of two samples to be taken today. This mix contains 15% RAP and 3% RAS. Note: Yesterday, the tickets displayed MD090057, I questioned the Plant Operator about this and he stated that it was the same thing as MD090088, he agreed to change it on the tickets from now on. Ignition Furnace Calibration Factor This sample has failed to meet specifications for exceeding the oil content and the #200 screen tolerances. Material fails to meet above specifications. meets



Form: HMA - 0.45 Gradation Chart

## KC-09-1224

			Plant In	formation								
Sampling Location	Truck	Bed @ Plant	_Mix Temp	329								
Collection Date/Time	9/23/0	@ 7:35 AM Oil Temp 330		330				Dil Temp 330		M Oil Temp 330		
Sample ID	KC	-09-1224	_Air Temp	57	•							
		G	yratory Data	(AASHTO T	312)							
Initial wt. of Uncompa	cted mix.		4800.0									
Height in mm of Samp	ole @ Initial (	Gyrations	124.9	_ 8		Compaction	Temp. =	291				
Height in mm of Samp	ole @ Design	Gyrations	113.3	_ 100								
		lgı	nition Furnace	(AASHTO	Г 308)							
Mass of Empty Bas	ket	3010.1	-	Percent Lo	ss (Ticket)	in %:	7.32	_				
Mass of Basket & S	ample	4867.9	<del>-</del> >	Temp. Con	np. (Ticket)	) in %:	0.16	_ Oil:				
Sample Weight		1857.8	<del>-</del> ×:	Ignition Fu	rnace ID:		TIKI	_				
Calibration Factor i	n %:	0.53	_	Mass of Re	es. Agg. &	Bask.	4734.2	6.4				
		Moisture Co	ontent (WSD	OT FOP for A	ASHTO T	329)						
Tare Weight	512.0	-			Min. test s	ample 500g.						
Sample + Tare Wt.	1176.6	_Time	8:46	_	163 +/- 14°	°C for the ov	en temp.					
Sample + Tare Wt.	<u>1175.6</u>	_After 90 min.	10:40	-				Moist %				
Sample + Tare Wt.	1175.4	_After 120 min.	11:10	_(Use Milita	ry Time, ex	c. 00:00)		0.18				
			Rice Data (A	ASTM D 204	1)							
					30 mm or	less Hg at 15	min.					
Sample Mass			1528.6	_			1					
Mass of Pycnomete	r Under Wa	ter @ 25.0 °C	1277.5			Min. Mass		RICE:				
Pycnometer Calibra	tion @ 77°F	•		_	1/2"	1500g		152.5				
Mass of Sample & P	ycnometer	Under Water	2182.1	_	3/4"	2000g	1					
Temperature of Wat	er 25.0 ± 1.0	0 °C	24.8	= 1	1"	2500g						
Sieve Analys	sis (AASH)	TO T 30)			Ві	ulk Specific (	Gravity					
Mass of Dry, Washe	ed Sample	1613.1	<del>-</del> -									
1 1/2"	_ #8	1050.9	<del></del> :	Majorint in	A i							
1"	#16	1259.0		Weight in			771.5	<del></del> -				
3/4"0.0	#30	1394.5	<del>-</del> ;	Weight in			304.0	_				
1/2" 149.0	#50	1487.9	-	Weight SS Temp 25.0			773.2	_				
3/8" 302.4	#100	1551.2	<b>→</b> 0	1 emp 25.0	± 1.0 C	-	25.0	_				
#4	#200	1600.1	-									
Pan	1612.9	_										



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### **HMA Volumetric Worksheet**

	1111111 1 0 1 1 1 1	notite inclinence:		
Project: SE 416th St Overlay	, Shingles in Paving	<b>Demo</b> Project Number	er:C0045550	C09
Mix ID: MD090088	Sample ID:	KC-09-1224	HMA Class:	1/2"
	Rec	quired Data		
Percent Binder (Pb)				6.4
% Pass #200 Sieve				7.2
Gmm (Rice Specific Gravity)				2.450
Compaction Temperature in °F			······································	291
Initial Weight of Uncompacted Mixtur	e			4800.0
Number of Gyrations @ Initial				8
Number of Gyrations @ Design				100
Gb (Specific Gravity of the Binder)	·····			1.028
Gsb (Bulk Specific Gravity of the Agg	regate Blend)			2.64
		ific Gravity "Gmm" (AST	TM D 2044)	2.01
(N) Sample Mass	oretical Maximum Spec	Sinc Gravity Gillin (AS)	W D 2041)	1528.6
(O) Mass of Pycnometer Under Water				
(P) Pycnometer Calibration @ 77°F	71			1277.5
(Q) Mass of Sample & Pycnometer L	Inder Water			2182.1
(R) Temperature of Water in °C	muci vvalti			24.8
(S) Pycnometer Calibration @ Test T	omporature			24.0
(T) Bitumen Thermal Correction	<del>опрогасите</del>			
				1 00005
(U) Water Thermal Correction				1.00005
(V) Gmm @ 25°C = N*U/(N-(Q-O))	. 3			2.450
(W) Density @ 25°C = V*62.245 lb/f				152.5
		vity "Gmb" (ASTM D2726	5) 	
A = Mass in Grams of Specimen in A				4771.5
B = Mass in Grams of Surface-Dry S				4773.2
C = Mass in Grams of Specimen in V	Vater			2804.0
Temperature of the Water °C				25.0
D = Temperature Correction for Dens	sity of Water			1.0000
Gmb =D A / (B-C)			(nearest 0.001)	2.423
Absorption = ((B-A) / (B-C))*100			(nearest 0.001)	0.086%
	Gyratory Compac	tor Data (AASHTO T 312	)	
H @ Nini (Height of Sample @ Initial	Gyrations)			124.9
H @ Ndes (Height of Sample @ Des	ign Gyrations)			113.3
% Gmm @ N ini = (Hdes*Gmb)/(Hir			(nearest 0.1)	89.7
%	100		(nearest 0.1)	98.9
	Air Voids (Va) {W	SDOT Std. Spec. 9-03.8(	7)}	
Va = 100 *(1-(Gmb/Gmm))	JMF Toleran	ce = 2.5% to 5.5%	(nearest 0.1)	1.1
Voids ir	n Mineral Aggregate (V	MA) {WSDOT Std. Spe	ec. 9-03.8(7)}	
VMA = 100 *(1-(Gmb*Ps/(Gsb*100))		a = Min. 14.0%	(nearest 0.1)	14.1
	·			
VFA = 100 * [(VMA - Va) / VMA]	Filled With Asphalt (V	FA) $\{$ WSDOT Std. Spectria = $65 \text{ to } 75$	(nearest 0.1)	92.2
	h he have the collection and the construction of the construction			
	st / Asphalt Ratio (D/A)	) {WSDOT Std. Spec. 9		2.706
Gse = (100 - Pb) / [(100 /Gmm) - (Pb			(nearest 0.001)	2.706
Pbe = $-(P_s*Gb)*(Gse-Gsb)/(Gse*Gsb)$	J)*FU		(nearest 0.1)	5.5
P <sub>s</sub> = 100 - Pb			(nearest 0.1)	93.6
D/A = % Passing #200 Sieve / Pbe	Mix Criteri	ia = 0.6 to 1.6	(nearest 0.1)	1.3



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	Mix Design Req	<b>Juirements a</b> l	nd Specifications		
Project: SE 416th St Overlay, SI	ningles in Pavi	ng Demo.	Project Number:	M780	030
Contractor: Woody	worth & Co.		Contract Number:	C0045	555C09
Asphalt Supplier: Wood	worth Lakesvie	w	Mix ID: MD09008	38 HMA C	lass: 1/2"
Oil Source: U	.S. Oil		Resident Engineer:	Frank	Overton
		Gradation			
	Contractor JMF			Con	ntrol Points
Sieve Size	% Passing		Tolerances		lass 1/2"
		*LL	*UL	LL_	UL
1 1/2"					
1"					
3/4"	100	99	100	100	100
1/2"	94	90	100	90	100
3/8"	84	78	90	0	90
#4	57	52	62		Variable (III)
#8	39	35	43	28	58
#16	27				
#30	19				***************************************
#50	13				······
#100	8				
#200	6.3	4.3	7.0	2.0	7.0
Aggregate Source (Pit #)	B-333	B-160			
Binder Grade (PG)	64-22	ESAL	S (millions)	3	to <u>&lt;30</u>
% Asphalt Content Design	5.6			5.1%	to6.1%
% Anti Strip	0.00				
% Water					2% max
% Va @ Ndes C	3.7			2.5	to5.5
% VMA @Ndes C	14.3			14	to N/A
% VFA @ Ndes C	74			65	to75
Dust/Asphalt Ratio C	1.4			0.6	to1.6
Pbe C	4.5				
Gmm S	2.463	SE Sp	pecification		45
Gmb S	2.374	Fractu	ıre	Single face	90%
				Double face	
Gsb (Aggregate Blend) S	2.640	Fine A	Aggregate Angularity		44% min.
Gsb (Fine Aggregate) S	2.599				
Gb (Binder) S	1.028				
Mixing Temperature in °F	313				
Max. Mixing Temperature in °F	350				
Compaction Temperature in °F	291				
Number of Gyrations @ Initial	88			Cop	pies Distribution
Number of Gyrations @ Design	100			2	Resident Engr.
Number of Gyrations @ Max.	160			1	Const. Admin.
######################################				'sia	

**C** = Use Contractors Information

S = Use WSDOT Information

UL=Upper Limit

\*LL=Lower Limit



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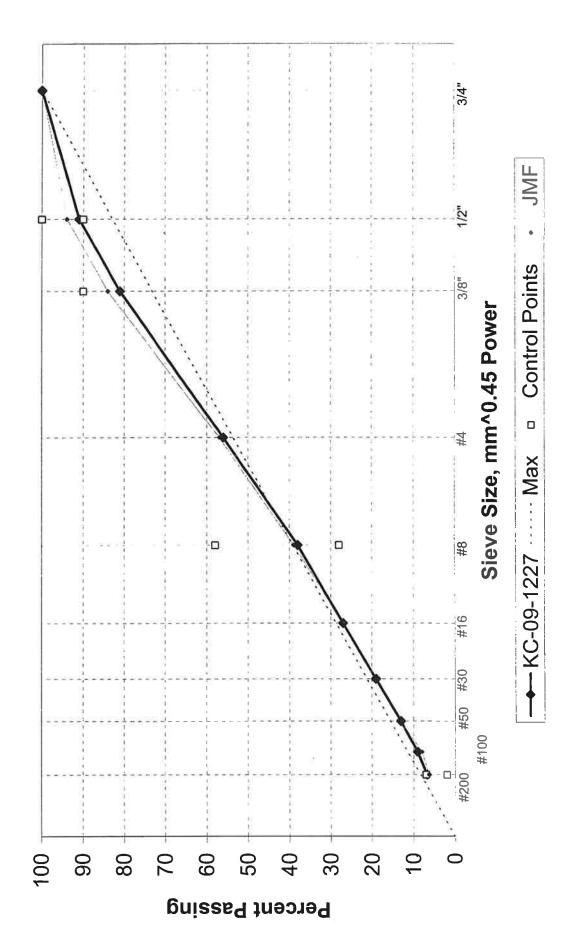
			HMA	lest Results				
Project: SE 416	th St Overlay,	Shingles in Pa	ving Den	no. Project Number:	M7	78030		
Contractor:	Wood	lworth & Co.		Contract Number:	C00	4555C09	1	
			iew	Sampling Location:		Bed @ F		
Oil Source and G	Grade:	U.S. Oil		Collection Date/Time:	9/23/0	9 @ 10:	50 AN	/
Mix ID: ME	0090088	Sam	ole ID:	KC-09-1227	HMA Clas	s:	1/2'	· 
G	Gradation (AASI	HTO T 30)		Volui	netrics (AASHT	O T 312)		
						7	olera	nces
Sieve Size	% Passing				0.0	" *LL		*UL
4.4/01			*UL	% Va @ Ndes	0.9	2.5	to	5.5
	····			% VMA @Ndes	13.8	12.5	- to -	N/A
			400	% VFA @ Ndes	93.5	65	. to _	75
			100	Dust/Asphalt Ratio	1.3	0.6	_ to _	1.6
		90 to	100	Gmm (WSDOT FOP fo		2.451	15	52.6 lb/ft <sup>3</sup>
3/8"	81	78 to	90	Gmb (ASTM L	02726)	2.428		
#4	56	to		Asphalt Content % (K	CDOT FOP for AASI	HTO T 308)		6.3
#8	38	35 to	43	% Water (WSDOT FOP	for AASHTO T 329)	0.17		2.0 max
#16	27	to						
#30	19	to		Mix Temperature in	°F	315		
#50	13	to		Oil Temperature in °		330	f	
#100	9	to		Air Temperature in °		70	Ė	
#200	6.8	4.3 to	7.0				Š	
			Data fro	*LL=Lower Limit U om Mix Design	L=Upper Limit			
Aggregate S	Source B-33	3 B-160	0	Gb (Binder)		1.028		
Asphalt Cont	ent Design	5.6%	= 14	Mixing Temperature	in °F	313		
Anti Strip		0.00%	=== ===	Compaction Temper	ature in °F	291	å s	
Pbe		4.5	_	Number of Gyrations	s @ Initial	8		
Gsb (Aggreg	ate Blend)	2.64		Number of Gyrations	s @ Design	100		
		2.599		ESAL'S (millions)		3	to	<30
Pomarke:							_	
Sample was obtained by ticket #245081. This true contains 15% RAP and	uck was the 18th loa I 3% RAS. This sam	d of the day. The ac	cumulative to	onage was 577.14. This is the sec	cond of two samples t	o be taken to	oday	This mix
Material		_meets abov fails to meet		specifications.		Copies	Resid	bution lent Engr.
Approved for				Tested and Submitted by: TEP 9	/23/2009	1		. Admin. Engineer
Asphalt Supplier:			Date	Initial			DG113.	FUAUICEI
	materiais Engin	eer	Ua(E		10/9/09	,		
Form: HMA - Te	est Results				40 M W	Do:	riend: Al	122/09



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Project: SE 4161	th St Overlay, Shin	gles in Paving I	Demo Project Nu	ımber:	N	178030			
Contractor:	Woodworf	th & Co.	Contract N	Contract Number:			C004555C09		
Asphalt Supplier:	Woodwor	th Lakesview	Sampling	Location:	Trucl	k Bed @	Plant		
Oil Source and G		U.S. Oil	Collection	Date/Tim	e: 9/23/	/09 @ 10	:50 AM		
	090088	Sample ID:	KC-09-1227	Н	MA Class:	1/2			
		e Content (WSD							
	Initial	After 90 mir			120)				
Time	11:41	1:11	1:5				9		
Tare Weight	513.5	513.5	513						
Sample + Tare Wt.	1471.1	1469.5	146		Mass (Wt.) H <sub>2</sub>	0	1.6		
Sample Weight	957.6	956.0	956		Percent H <sub>2</sub> O		0.17		
	la	nition Furnace I	Data (AASHTO	T 308)					
Mass of Empty Bask		3010.4	Ignition Furi			Т	IKI		
Mass of Baskets and		4704.9			4 ( 4 0 (				
Mass of Sample:		1694.5	Actual As	sphalt Co	ntent in %:	nt in %: 6.			
Calibration Factor (T	icket) in %:	0.53	Mix Design	Asphalt Co	ntent in %:	5	5.6		
Percent Loss (Ticket		7.15	Mass of Re			45	85.9		
	ensation (Ticket) in %:	0.18	Mass of Re	sidual Agg.	(Direct):	15	75.5		
Calibrated Asphalt Content (Ticket) in %:		6.44							
Difference of Mass	es of Residual Aggreg	ate - Direct vs. Tic	ket = 0.1%	Specification	n: shall be wit	hin <u>+</u> 0.1%.			
		Sieve Analys	is (AASHTO T3	0)					
Mass of Dry Washed	l Residual Aggregate:	1475.7							
Sieve Size	Accumulative			To	lerance	Contro	ol Points		
*Record all sieves	Weight Retained	Percent Passing	JMF	Lower		Lower	Upper		
Sieve Size	<b>3</b>			Limit	Limit	Limit	Limit		
1 1/2"									
1"	0.0	100	100	99	100	100	100		
3/4" 1/2"	0.0 140.2	91	94	90	100	90	100		
3/8"	291.8	81	84	78	90	0	90		
#4	688.2	56	57	70		Ū	00		
#8	970.5	38	39	35	43	28	58		
#16	1152.6	27	27						
#30	1276.6	19	19						
#50	1365.1	13	13						
#100	1425.9	9	8						
#200	1469.1	6.8	6.3	4.3	7.0	2.0	7.0		
Pan	1475.6								
Difference of Masses	s - Pan vs. Washed =	0.0% Spec	cification: shall be v	within ± 0.2	%				
Sample was obtained by truck #81-181, ticket #2-be taken today. This mi	Within Tolerance Lir y King County Representa 45081. This truck was the ix contains 15% RAP and libration Factor changed fi	ative Maser Brown. A o a 18th load of the day. 3% RAS. This sample	The accumulative tor	as taken by V nage was 57°	7.14. This is the	nple was obt second of to	ained from wo samples to		
Material	meets	X	fails to me	et	above s	pecifica	tions.		



Form: HMA - 0.45 Gradation Chart

## KC-09-1227

				Plant in	formation				
Sampling L	ocation.	Truck	Bed @ Plant	_Mix Temp	315	_			
Collection D	ate/Time	9/23/09	@ 10:50 AM	Oil Temp	330	_			
Sample ID		кс	-09-1227	_Air Temp	70	_			
			G	yratory Data	(AASHTO T	Г <b>312</b> )			
Initial wt. of	Uncompac	cted mix.		4800.0	_				
Height in mn	n of Samp	le @ Initial (	Gyrations	124.9	_ 8		Compaction	Temp. =	291
Height in mn	n of Samp	le @ Design	Gyrations	113.3	100				
			lgr	ition Furnace	(AASHTO	Т 308)			
Mass of Em	npty Bask	et	3010.4	-	Percent Lo	oss (Ticket)	in %:	7.15	_
Mass of Bas	sket & Sa	mple	4704.9	-	Temp. Cor	mp. (Ticket)	in %:	0.18	_ Oil:
Sample We	ight		1694.5	<del>-</del> ,	Ignition Fu	urnace ID:		TIKI	<del></del> >
Calibration	Factor in	<b>%</b> :	0.53	-	Mass of R	es. Agg. & l	Bask.	4585.9	6.3
			Moisture Co	ontent (WSDC	OT FOP for A	AASHTO T	329)		
Tare Weigh	t	513.5	_	1		Min. test s	ample 500g.		
Sample + Ta	are Wt.	1471.1	Time	11:41	_	163 +/- 14°	C for the ov	en temp.	
Sample + Ta	are Wt.	1469.5	_After 90 min.	1:11					Moist %:
Sample + Ta	are Wt.	1469.5	After 120 min.	1:53	_(Use Milita	ry Time, ex	. 00:00)		0.17
				Rice Data (A	ASTM D 204	1)			
						30 mm or	less Hg at 15	min.	
Sample Mas	ss			1567.8	_			Ì	
Mass of Pyo	cnometer	Under Wa	ter @ 25.0 °C	1277.5	_	ř	Min. Mass		RICE:
Pycnometer	<del>r Calibrat</del>	ion @ 77°F	i		_	1/2"	1500g		152.6
Mass of Sar	mple & Py	cnometer	Under Water	2205.6	_	3/4"	2000g		
Temperatur	e of Wate	er 25.0 ± 1.0	o°C	25.0		1"	2500g		
Siev	e Analys	is (AASHT	О Т 30)			Вι	ılk Specific G	Bravity	
Mass of Dry	, Washed	d Sample	1475.7	-					2
1 1/2"		#8	970.5	<del>.</del> .					
1" _		#16	1152.6	<b>-</b> 2	Weight in		47	781.2	<del>-</del> -
3/4" _	0.0	<del>-</del> #30	1276.6	•:	Weight in			313.7	_
1/2" _	140.2	#50	1365.1	•:	Weight SS		47	782.8	_
3/8" _	291.8	#100	1425.9	•	Temp 25.0	± 1.0 ℃	2	25.0	_
#4 _	688.2	#200	1469.1	es.					
	Pan	1475.6	=6						



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### **HMA Volumetric Worksheet**

The other was a state of the st		
Project: SE 416th St Overlay, Shingles in Paving Demo Project Numb	er: <b>C004555</b>	C09
Mix ID: MD090088 Sample ID: KC-09-1227	HMA Class:	1/2"
Required Data		
Percent Binder (Pb)	T WARRIES - BELLEVILLE BOTTON BELLEVILLE BOTTON BOT	6.3
% Pass #200 Sieve		6.8
Gmm (Rice Specific Gravity)		2.451
Compaction Temperature in °F		291
Initial Weight of Uncompacted Mixture		4800.0
Number of Gyrations @ Initial		8
Number of Gyrations @ Design		100
Gb (Specific Gravity of the Binder)		1.028
Gsb (Bulk Specific Gravity of the Aggregate Blend)		2.64
Theroretical Maximum Specific Gravity "Gmm" (AS	TM D 2041)	
(N) Sample Mass		1567.8
(O) Mass of Pycnometer Under Water		1277.5
(P) Pycnometer Calibration @ 77°F		
(Q) Mass of Sample & Pycnometer Under Water		2205.6
(R) Temperature of Water in °C		25.0
(S) Pycnometer Calibration @ Test Temperature	/////	
(T) Bitumen Thermal Correction		
(U) Water Thermal Correction		1.00000
(V) Gmm @ 25°C = N*U/(N-(Q-O))		2.451
(W) Density @ 25°C = V*62.245 lb/ft <sup>3</sup>		152.6
Bulk Specific Gravity "Gmb" (ASTM D2720	6)	
A = Mass in Grams of Specimen in Air		4781.2
B = Mass in Grams of Surface-Dry Specimen in Air		4782.8
C = Mass in Grams of Specimen in Water		2813.7
Temperature of the Water °C		25.0
D = Temperature Correction for Density of Water		1.0000
Gmb =D A / (B-C)	(nearest 0.001)	2.428
Absorption = ((B-A) / (B-C))*100	(nearest 0.001)	0.081%
Gyratory Compactor Data (AASHTO T 312	2)	
H @ Nini (Height of Sample @ Initial Gyrations)		124.9
H @ Ndes (Height of Sample @ Design Gyrations)		113.3
% Gmm @ N ini = (Hdes*Gmb)/(Hini*Gmm)*100	(nearest 0.1)	89.9
% Gmm @ N des = (Gmb)/(Gmm)*100	(nearest 0.1)	99.1
Air Voids (Va) {WSDOT Std. Spec. 9-03.8(	(7)}	
Va = 100 *(1-(Gmb/Gmm))	(nearest 0.1)	0.9
Voids in Mineral Aggregate (VMA) {WSDOT Std. Spo	ec. 9-03.8(7)}	
VMA = 100 *(1-(Gmb*Ps/(Gsb*100)))	(nearest 0.1)	13.8
Voids Filled With Asphalt (VFA) {WSDOT Std. Spec	c. 9-03.8(7)}	
VFA = 100 * [(VMA - Va) / VMA]	(nearest 0.1)	93.5
Dust / Asphalt Ratio (D/A) {WSDOT Std. Spec. 9	9-03.8(2)}	
Gse = (100 - Pb) / [(100 /Gmm) - (Pb / Gb)]	(nearest 0.001)	2.703
Pbe = -(P <sub>s</sub> *Gb)*(Gse-Gsb)/(Gse*Gsb)+Pb	(nearest 0.1)	5.4
P <sub>s</sub> = 100 - Pb	(nearest 0.1)	93.7
D/A = % Passing #200 Sieve / Pbe Mix Criteria = 0.6 to 1.6	(nearest 0.1)	1.3



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King County
Mix Design Requirements and Specifications

Project: SE 416th St Overlay, Shingles in Paving Demo.			Project Number		M78030		
Contractor: Woodworth & Co.				<del>-</del> ,		C004555	
Asphalt Supplier:	Wood	worth Lakesview	<i></i>	Mix ID: MD0	90088 F	HMA Clas	ss:1/2"
Oil Source:	U	.S. Oil		Resident Engine	er:	Frank Ov	verton
			Gradation				
	1	Contractor JMF					ol Points
Sieve Size		% Passing	CATC	Tolerances			s 1/2"
v: 0.360			*LL	*UL	T T	.L.	UL
1 1/2"							
3/4"		400		100		00	100
1/2"		100	99			90	100
		94	90	100		0	100
3/8"		84	78	90		0	90
#4		57	52	62			
#8		39	35	43	<del> </del>	28	58
#16		27					
#30		19					
#50		13					
#100		8		7.0			7.0
#200		6.3	4.3	7.0		2.0	7.0
Aggregate Source (Pit #)		B-333	B-160				
Binder Grade (PG)		64-22	ESAL	'S (millions)			to <u>&lt;30</u>
% Asphalt Content Desig	n	5.6			5.	.1%	to
% Anti Strip		0.00			35		
% Water							2% max
% Va @ Ndes	C	3.7			2	2.5	to <u>5.5</u>
% VMA @Ndes	С	14.3				14	to <u>N/A</u>
	C	74					to <u>75</u>
Dust/Asphalt Ratio	С	1.4				0.6	to1.6
Pbe	С	4.5					
Gmm	S	2.463		pecification			45
Gmb	S	2.374	Fracti	ure	Single fac		90%
					Double fac	ce	
Gsb (Aggregate Blend)	S	2.640	Fine /	Aggregate Angular	ity		44% mir
Gsb (Fine Aggregate)	S	2.599					
Gb (Binder)	S	1.028					
Mixing Temperature in °F		313					
Max. Mixing Temperature		350					
Compaction Temperature		291					<b></b>
Number of Gyrations @ I		8				Copies	Distribution
Number of Gyrations @ I		100				2	Resident Engr.
Number of Gyrations @ !	Max.	160				1	Const. Admin.
*LL=Lower Limit UL=Up	per Limit	C = Use Contra	ctors Informa	tion <b>S</b> = Use WSI	OOT Information		



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**HMA Mineral Aggregate Results** 

		4400 010		yyreyate nesuit			1470000	
Project:	SE	416th St Overla	ay	Project Number:			M78030	
Contractor:		Woodworth		_Contract Numbe			00455C09	
Name of Source:		s Sand and Gra		Sampling Locati			Plant/Belt	
Lab Sample Number		KC-09-		Collection Date:	-		2009 @ Afte	
Mix ID: MD090	088			ampled By:		HMA C	lass:	1/2"
		Sand	Equivalent 1	Test (AASHTO	T-176)			
SE Value	= Sa	nd Reading (100	0)	Clay Reading	Sand F	Reading	SE Value	
		Clay Reading	<del></del>	6.4	3	.5	55	
				Specification =	45	Min.		
	Per	centage of Fr	acture in Co	urse Aggregate	e (AASH	TO TP-6	1)	
P = Percent o				s of questionable		or borderli	ne particles	
F = Mass of fr	actured	r		s of unfractured p				
(#.F)	6	Sieve Size	F	Q	N		Р	
$\left  \left( F + \left( \frac{Q}{2} \right) \right) \right $		1"		-		-		
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right $	*100	3/4"	050.0				400	
PTQTN		1/2"	652.2	0.0	0.0	-	100	
		3/8"	497.8	0.0	4.3		99	
0	<b>6</b> ! 4!	#4	312.7	0.0	1.7		99	
Speci	fication	_	Face = 90 %	Double Fa				
	Unc	ompacted Vo	id Content of	Fine Aggrega	te (AASI	1TO T-30	04)	
V = Volume o	f cylindr	rical measure, m		G = Bulk	k dry speci	fic gravity	fine agg. (G	i <sub>h</sub> )
	-							
F = Net mass, g, of fine aggregate in  Preparation of Test Sample					•	-		
Sieve Size				185	.64	$U = \begin{vmatrix} v \\ - \end{vmatrix}$	$\left(\frac{-\left(F/G\right)}{V}\right)^{*}$	)
#8 - #16	4	44 +/- 0.2 g	1-12			L	<i>'</i>	
#16 - #30		57 +/- 0.2 g	V	F	G		U	
#30 - #50		72 +/- 0.2 g	100.0	141.89	2.599		45.4	
#50 - #100	)	17 +/- 0.2 g	100.0	141.24	2.599		45.7	
Specific	Specification 44 Min.				Ave	rage	46	
Remarks:								
	X	meets						
Material			above sp	pecifications.			Copies	Distribution
		fails to meet					2	Resident Engr.
Approved for				ested and			1	Const. Admin.
Distribution By:				ubmitted by: CW		09	<del></del>	
	Materia	ls Engineer	Date	Initia	I Date			



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4-10			ggregate <b>Ke</b> suits			
Project:	SE 416th St Overl	ay	Project Number:		M78030	
Contractor:	Woodworth		Contract Number	:	C00455C09	
Name of Source: M	iles Sand and Gra	vel Roy Pit		n:	Plant/Belt	
Lab Sample Number: _	KC-09-	1228	Collection Date:	9	/23/2009 @ Aft	ernoon
Mix ID: MD090088	Pit #: <b>E</b>	3 <b>-333</b> Sa	ampled By:	TEP HM	/IA Class:	1/2"
	Sand	Equivalent 1	est (AASHTO 1	-176)		¥
SE Value=	Sand Reading (10	0)	Clay Reading	Sand Readir	ng SE Value	
_	Clay Reading		6	3.3	55	
			Specification =	45 Min		_
P	ercentage of Fr	acture in Cou	ırse Aggregate	(AASHTO T	P-61)	
P = Percent of frac	turo	0 - 14	£	معطيم معلما	وواوناه والمواور	
			s of questionable p		derline particles	
F = Mass of fractur			of unfractured pa			
F/ (- a) 7	Sieve Size	F	Q	N	P	
$\left \left(F+\left(\frac{Q}{2}\right)\right)\right $	3/4"					
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right  *100$	1/2"	20.2	0.0	0.0	400	
1 2		20.2			100	
2 2	3/8"	727.8	0.0	27.8	96	
Canaificati	#4	374.5	0.0 Double Fac	0.7	100	
Specificati		Face = 90 %			T 204)	
U	ncompacted Vo	d Content of	Fine Aggregate	e (AASHIU	1-304)	
V = Volume of cylir	ndrical measure, m	*	G = Bulk	dry specific gr	avity fine agg. (0	ą̂ь)
F = Net mass, g, of	f fine aggregate in	measure	U = Unco	mpacted voids	s, percent, in the	material
Preparation of To					[v_(F/)]	
Sieve Size	Mass	Tare	185.6	54 <i>U</i>	$= \left\lceil \frac{V - \left(F/G\right)}{V} \right\rceil * 100$	)
#8 - #16	44 +/- 0.2 g			*	L ' J	
#16 - #30	57 +/- 0.2 g	V	F	G	U	
#30 - #50	72 +/- 0.2 g	100.0	138.4	2.599	46.7	
#50 - #100	17 +/- 0.2 g	100.0	137.88	2.599	46.9	
Specification	44 Min.			Average	47	
Remarks:						
X	meets					
Material		above sp	ecifications.		Copies	Distribution
· · · · · · · · · · · · · · · · · · ·	fails to meet				2	Resident Engr.
Approved for		<del></del> .	ontod and		1	Const. Admin.
Distribution By:			ested and ubmitted by:CW	9/28/2009	-	
Mat	terials Engineer	Date	Initial	Date		



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	Lakeviev		1190ft	9	% of Rice	98.0	97.8	97.6	97.5	97.6
l ∟	Flant	Rand. #	O'(A)	# J07	Rice Density	152.4	152.4	152.4	152.4	152.4
	WOODWOTTH	MD090088	Lot Length to nearest $100'(A)$ = $V(R^3)/W(R) \times D(R)$ =		Corrected Gauge	149.4	149.0	148.8	148.6	148.7
O Sairing	raving co.	MDG		ACP Test Temp.	Corr. Fact.	1.008	1.008	1.008	1.008	1.008
Woods	VY COCKWOLEN	Mix I.D.	2635.0 ft3		Avg. Reading	148.2	147.8	147.6	147.5	147.6
Drimo	_			Enumclaw	<b>v</b> o					
		#2659		c.	Gauge Readings	147.6	148.8	146.6	148.1	148.3
		Troxler 4640B #2659	200 Tons	700.	Gar	148.8	146.8	148.6	146.8	146.8
Cootion	OBCIO	_	Size		Depth	0.17	0.17	0.17	0.17	0.17
		9	Subior Size	.	Offset	9.5' RT	6' RT	2'RT	10' RT	7'RT
_		Gauge	0.17ft	Sta. to Sta.				_		
AA.	2	\$	= (a)	Ste						
Strode	study	End Air Temp.	13ft   Depth (D) =	L) 238ft	ation	0	0	9	0	0
446th DAC Chirds	2	20	- (M	0.2] = (	Test Location	89+20	87+50	85+06	82+90	80+80
4460	4100	nt Air Temp.	t3   Width (W) =	Sublot Ln. $[(A) \times 0.2] = (L)$	. <del>.</del>					
Droiont	oberi	Wearing Start Air Temp.	0.0759 Tons/ft3	gnS						
-	1				ge	ရွ	ရွ	ရွ	ຄ	္ဌာ
0/23/00	312370	#7   r#	nsity (p)	+	Location Code	Section #3				
-	- 1	s 1/2"	Estimated Density (p) =	Sta.	Loci	S	Š	S	Se	Š
geo	3	Class	Estim	Beg. Sta.	Test	1	2	3	4	2

7.79	1190ft	7	% of Rice	97.3	96.0	97.9	94.7	94.3	96.0
	100'(A)   (ff.)=	Lot #	Rice Density	152.4	152.4	152.4	152.4	152.4	
Lot Avg.	Lot Length to nearest $100'(A)$ = $V(R^3) / W(R) \times D(R)$ =		Corrected Gauge	148.3	146.3	149.1	144.3	143.7	Lot Avg.
		ACP Test Temp.	Соп. Fact.	1.008	1.008	1.008	1.008	1.008	
	2635.0 ft3	AC	Avg. Reading	147.2	145.1	148.0	143.2	142.6	
	Vol. of ACP in Sublot $(V) = (S)/(p) =$	Enumclaw	S						
Walley willows	Vol. of ACP	0	Gauge Readings	146.7	144.8	147.4	143.4	142.7	
	200 Tons	700.	Gau	147.6	145.4	148.5	143.0	142.5	
No. of the Party o	Size	8	Depth	0.17	0.17	0.17	0.17	0.17	
500000000000000000000000000000000000000	Subiof Size	12	Offset	3'RT	5' RT	8.5° RT	4'RT	2.5' RT	
	= 0.17ft	Sta. to Sta.							
	Depth (D) =	238ft							اندا
20 20 20 20 20 20 20 20 20 20 20 20 20 2	0.0759 Tons/ft3   Width (W) =   13ft	Sublot Ln. $[(A) \times 0.2] = (L)$		77+50	74+85	71+75	69+45	67+20	Field tests performed using KCDOT Test Method N-1.
		+	opo;	#3	#3	#3	#3	#3	sts performe
	Estimated Density (p) =	-	Location Code	Section #3	Fleld te				
	Estimat	Beg. Sta.	Test	-	2	ဗ	4	သ	

Pavers: Blaw Knox PF-5510 #711	Rollers	Bre
Remarks: Woodworth paved test section #3 on the plan sheet. They planned to do 1000 tons. The asphalt		Sake
placed today had 15% RAP and 3% RAS.		
	Passes	4
	Roller Codes:	odes:

Intermediate IR 110 HF DDV	4 Vibe 2-3 Static
Breakdown Sakal GW 750 P	4 Vibe
Rollers	Passes

Roller Codes: SDV - Single Drum Vibrator

P-Pneumatic

DDV Double Drum Vibrator TS - Tandem Steel

Tester informed paving contractor and K.C. Inspector of the day's test results.

Date 9/28/2009

Field Eng./Tester

9-23-09 RAP & RAS Lots 6 & 7



155 Monroe Avenue NE, Bidg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

Date	9/23/09	Project		416th RAS Study	AS Stud	_ 	No.			Section	l uc		Prime	Woodworth	h   Paving Co.	D. Woodworth	orth Plant	Lakeview
Class	112" Lift		Start Aii	Start Air Temp.	48 En	End Air Temp.	np. 84	Gauge		Ι΄.	Troxler 4640B #2659	B #2659		Mix I.D.	W	MD090088	Rand.	#
Estima	Estimated Density (p) =	0.0759 Tons/ft3		Width (W) =	= 13ft		Depth (D) =	0.17ft		Subiol Size	200 Tons			2635.0 ft3		Lot Length to nearest $100'(A)$ = $V(H^3) / W(H) \times D(H)$ =	st 100 (A)   .D(ft )=	1190ft
Beg. Sta.	ta. +		Sublot Ln	Sublot Ln. $[(A) \times 0.2] = (L)$	(7) =	238ft		Sta. to Sta.				Loc.	Enumolaw		ACP Test Temp.	р.	Tot #	80
Test	Location Code			Test	Test Location	_			Offset	Depth	O	Gauge Readings	S	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
-	Section #3			9	65+00				10' RT	0.17	145.5	143.8		144.7	1.008	145.8	152.4	95.7
2	Section #3			9	63+75			47	5.5' RT	0.17	144.4	143.3		143.9	1.008	145.0	152.4	95.1
ы	Section #3			00	89+00				7.5. LT	0.17	145.2	146.6		145.9	1.008	147.1	152.4	96.5
4	Section #3			80	87+15				3.5' LT	0.17	148.9	147.7		148.3	1.008	149.5	152.4	1.86
က	Section #3			60	84+80				10. LT	0.17	148.3	147.8		148.1	1.008	149.2	152.4	97.9
													100000			Lot Avg.	ģ	96.7
Estime	Estimated Density (p) =	0.0759 T	0.0759 Tons/ft3	Width (W) =	= 13ft		Depth (D) =	0.17ft		Subjot Size	200 Tons		Vol. of ACP in Sublot $(V) = (S)/(p) = (S)/(p) = (S)/(p)$	= 2635.0 ft3		Lot Length to neerest 100' (A) = $V(H^3) / W(H) \times D(H) =$	st 100 (A)	1190ft
Beg. Sta.	ta. +		Sublot Lr.	Sublot Ln. $[(A) \times 0.2] = (L)$	1 = (1)	238ft		Sta. to Sta.				Loc.	Enumclaw		ACP Test Temp.	p.	# J07	o
Test	Location Code								Offset	Depth	υ	Gauge Readings	sß	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice	% of Rice
-	Section #3			80	82+53				2.5' LT	0.17	144.9	143.5		144.2	1.008	145.4	152.4	95.4
2	Section #3			80	80+25				4.5' LT	0.17	148.2	147.3		147.8	1.008	148.9	152.4	7.76
က	Section #3			7	77+65				8.5' LT	0.17	141.9	143.4		142.7	1.008	143.8	152.4	94.4
4	Section #3			7	75+50				9.5' LT	0.17	141.4	143.6		142.5	1.008	143.6	152.4	94.3
r.	Section #3			7	73+10				6.5' LT	0.17	143.4	145.3		144.4	1.008	145.5	152.4	95.5
	Field tests performed using KCDOT Test Method N-1.	bemorned	using KC	DOT Test A	fethod i	₹.										Lot Avg.	ģ	95.4

Pavers. Diam niox PT-0010 #711	Kollers	Breakdown
Remarks: Woodworth paved test section #3 on the plan sheet they plan to pave 1000 tons. The asphalt		Sakal GW 750
placed today had 15% RAP and 3% RAS.		۵
	Passes	4 Vibe
	Roller C	Roller Codes: SDV - Single

Roller Codes: SDV - Single Drum Vibrator P-Pneumatic

4 Vibe

Intermediate IR 110 HF

DDV

DDV Double Drum Vibrator TS - Tandem Steel

E:

Tester informed paving contractor and K.C. Inspector of the day's test results.

Date 9/28/2009

Joe Karahuta

Field Eng./Tester



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	rigan		1	Struck	_			ŀ	- 1	02007		0,777	2	000000	-	*
	<i>5)</i>	Start Air Temp.	emp. 48	End Air Temp.	8	Gauge		1	Troxler 4640B #2659	3 #2659		Mix I.D.		MD090088	Rand. #	#
l -	0.0759 Tons/ft3	i ïi	Width (W) =	13ft   Depth (D)	11	0.17ft	Subior Size (S)		200 Tons			2635	2635.0 ft3	Lot Length to nearest 100 (A) = $V(ft^3) / W(ft) \times D(ft) =$	x D(ff.)=	1190ft
	7S	ublot Ln. [	Sublot Ln. $[(A) \times 0.2] = (L)$	(L) 238ft	Sta.	Sta. to Sta.			7	10c.	Enumclaw		ACP Test Temp.	тр.	# rot	10
			Test Location	cation		<b>8</b>	Offset De	Depth	ဗိ	Gauge Readings	S	Avg. Reading	Corr. Fact.	t. Corrected	d Rice Density	% of Rice
			70+90	06		.4	4.LT 0.	0.17	145.8	144.1		145.0	1.008	146.1	152.4	95.9
1			00+89	00		'n	9. LT 0.	0.17	145.9	145.1		145.5	1.008	146.7	152.4	96.2
1			66+25	25		2,	5' LT 0.	0.17	146.2	145.1		145.7	1.008	146.8	152.4	96.3
1		6	64+00	00		2.5	2.5° LT 0.	0.17	144.4	145.1		144.8	1.008	145.9	152.4	95.7
1			63+42	42		10.5	10.5° Lt 0.	0.17	147.4	148.6		148.0	1.008	149.2	152.4	6.76
11														Lot Avg.	ıvg.	96.4
11	0.0759 Tons/ft3		Width (W) =	Depth (D)	= (a)		Subjot Size	ezi		Vol. of AC	Val. of ACP in Sublot $(V) = (S)/(O) = (S)/$	iı	07	Lot Length to nearest $100'(A)$ = $V(H^3) / W(H) \times D(H)$ =	x D/ff )=	
1	Š	ublot Ln.	Sublot Ln. [(A) × 0.2] = (L)	(L) 238ft	Sta	Sta. to Sta.			7	100.			ACP Test Temp.	этр.	# to7	
						- B	Offset De	Depth	Ö	Gauge Readings	sbı	Avg. Reading	Corr. Fact.	t. Corrected	d Rice Density	% of Rice
10 J																
1 0																
11																
1 <b>5</b> 1	formed us	Ing KCD	Field tests performed using KCDOT Test Method N-1.	thod N-1.										Lot Avg.	łvg.	
1 41	Blaw Knox PF-5510 #711										Rollers	Breakdown	down	Intermediate	rte	
임	ved test s	ection #3	on the plan	Remarks: Woodworth paved test section #3 on the plan sheet they plan to pave 1000 tons. The asphalt	n to pay	re 1000 to	ns. The a	sphalt				Sakai GW 750	W 750	IR 110 HF		
ایت	placed today had 15% RAP and 3% RAS.	MS.										<u> </u>		Aga		
- 1											Passes	4 Vibe	eg e	4 VIbe		
- 1														2-3 Static		
											Roller Codes:		V - Single D	SDV - Single Drum Vibrator		P-Pneumatic
1												2	DOV Deuble Dains Vibrator	The Albander	F	TO Tonday Office

9-23-09 RAP & RAS Lot 10

Date 9/28/2009

Field Eng./Tester

Last Revised: 1/7/2010

## SE 416<sup>th</sup> Street Overlay: Shingles in Paving Demonstration

## **Construction Inspection and Quality Control Testing**

Paving Day 3 (9-24-09)

Inspectors Daily Report
HMA Test Results
HMA Mineral Aggregate Test Results
HMA Compaction Test Results

## KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

## **INSPECTORS DAILY REPORT Page 1 of 2**

DATE: Thursday September 24th 2009

Federal Aid #

White - Contract File Yellow - Project Engineer Pink - Inspector's Diary

Mode AFFIC CONTROL  IE: Odworth (Paver Ware) Of Knox paver ware diate/finish temp. on North the buggy. Previous, place water 5/09.Done at 4 oria Jeanne: (Con Project Con Proj	ng): 7am S r joint at 212 6+50. North th Jonathan oller and the side.12 nool evel South s o drop mat to 30pm. trinding): Co	High Yes	X  Place of the state of the st	No tack fr 36+50 erator. side si g South cover cened a	to 10+1 Shane u treets d/ side fro county p	50 to 10+1 17.Luke op using Saka ways.10.5 om st # 10- rep. Work.	on SE 416t 7 at 212th erating shu ai as b/dow 0 End pavi +17 to 36+ End at 2.4	On-Sm h st. Road o ave. Mob. E uttle buggy t in roller with ing at st# 10 50. End pav 15pm.Contin	Equipment. 8ai o transfer mix Willie operatii +17.Waited fo ring at 2.30 pn ued with com	n 236i m beg on to ng DL or 1hr, n, had pactio	Nonw s th and iin pavi paver. D-110F place v about n. Place	Low 65 vorkable No 212th aving. Place Al operations avater to a 10tons accepted temporation.	0 X ve.7.30 ee ating drop mix in
AFFIC CONTROL  OODWORTH (Paver)  OR Remove paper  or joint at st # 3  of Knox paver was  mediate/finish  temp. on North  tle buggy. Pre-  s, place water  5/09.Done at 4  oria Jeanne: (6	ng): 7am S r joint at 212 6+50. North th Jonathan oller and the side.12 noo evel South s o drop mat to 30pm.	High Yes 2th ave. side from as scree DD-28 n begin ide of ro- emp. Ro-	affic con Place of st # eed ope BHF for paving pad to co	ntrol si tack fr 36+50 erator. side si g South cover c	to 10+1 Shane u treets d/ side fro county p	50 to 10+1 17.Luke op using Saka ways.10.5 om st # 10- rep. Work.	7 at 212th erating shu ni as b/dow 0 End pavi +17 to 36+ End at 2.4	h st. Road of ave. Mob. E attle buggy t on roller with ing at st# 10 50. End pav 15pm.Contin	Workable TE INTERVIEW?  Closed betwee. Equipment. 8ai to transfer mix Willie operatii H17. Waited for ting at 2.30 pn tued with com	n 236i m beg on to ng DL or 1hr, n, had pactio	th and in paver. D-110H place v about n. Place	No 212th aving. Place Al open IF as water to 10tons ced temp	0 X ve.7.30 ee ating drop mix in
AFFIC CONTROL  OODWORTH (Paver)  OR Remove paper  or joint at st # 3  of Knox paver was  mediate/finish  temp. on North  tle buggy. Pre-  s, place water  5/09.Done at 4  oria Jeanne: (6	ng): 7am S r joint at 212 6+50. North th Jonathan oller and the side.12 noon evel South s o drop mat to 30pm. trinding): Co	Yes ————————————————————————————————————	affic con Place of st # eed ope BHF for paving pad to co	ntrol si tack fr 36+50 erator. side si g South cover c	to 10+1 Shane u treets d/ side fro county p	50 to 10+1 17.Luke op using Saka ways.10.5 om st # 10- rep. Work.	7 at 212th erating shu ni as b/dow 0 End pavi +17 to 36+ End at 2.4	h st. Road of ave. Mob. E attle buggy t on roller with ing at st# 10 50. End pav 15pm.Contin	closed betwee Equipment. 8a o transfer mix Willie operati +17.Waited fo ing at 2.30 pn ued with com	n 2360 m beg on to ng DL or 1hr, n, had pactio	th and in paver. D-110H place v about n. Place	No 212th aving. Place Al open IF as water to 10tons ced temp	X ve.7.30 ve ating drop mix in
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DD-110HF # 81  I Jeanne:  I SONNEL OI  I dworth: 1- Pro  I dor ( Luke Dill  I der ( Dave Thoi  I gers( Glen, Kal  I County: Joe  I County: Joe	I work truck( JD 510 # 20 ),Sakai GW I PROJEC ject Manage ard), I – Scre ton, Penny C v, Ray and F Lab),Jim Ea	(Chevy 203),1- Si 750 # 8  T: er( Scotted oper Cochran, 20 20 20 20 20 20 20 20 20 20 20 20 20	2500Hi huttle E 322 Prie t Dropp rator ( 1), 1 – F 1- Q.C (	D), 1- Buggy eumati Delman Jonath Raker ( ( Rene	Work tru ( SB- 25 c Roller ), 1- F/N an Pulla Ludvig ee Walto	500B # 715 ), Ken wor II ( Dan An ack), 2 – Ro Yefimov ),	5), 1- Pave th Water T dreas), 1- i oller opera 1 – Tack C	r( Blaw Kno ruck # 26, F Paver opera tors ( Shane	eter Bilt Tack Stors (Al Ander Thomas, Wil	ollers( Truck rson), lie Gu	I.R D (# 9 1- Shui illen), 2	D-28HF ttle bugg 2- Truck	# 841 'Y
5: d closed betwe	en 236Th av	e and 2	212th a	ve. Fla	aggers a	it each mai	ior crossina	a to stop car	rs enterina in t	o won	k zone	from 7a	m to
	k down rollei	r on 6 vi	ibes, D	D-110	as inter	mediate ro	iller on 4 v	ibes, 2 statio	c rolling patter	n and	DD-28	3 for Side	<del>)</del>
perature of laid	down mix ra	anged fr	rom 27(	0 deg.	To 3000	deg.Outsid	e air temp.	Was in the	mid 80deg.				
	D-110HF # 810 ia Jeanne: SONNEL ON dworth: 1- Pro ator ( Luke Dilla er ( Dave Thort gers( Glen, Katy ia Jeanne: County: Joe(i rs: Warren (En closed betwee Sakai as breal t / driveways.	D-110HF # 810,Sakai GW ia Jeanne:  SONNEL ON PROJEC dworth: 1- Project Manage ator ( Luke Dillard), I - Screer ( Dave Thorton, Penny Cyers( Glen, Katy, Ray and Fia Jeanne:  County: Joe(Lab),Jim Ears: Warren (Enumclaw wat closed between 236Th at Sakai as break down rolle to driveways.	D-110HF # 810,Sakai GW 750 # 8 ia Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scottator ( Luke Dillard), I – Screed ope er ( Dave Thorton, Penny Cochran gers( Glen, Katy, Ray and Paula), ia Jeanne: County: Joe(Lab),Jim Eagan,Kri. rs: Warren (Enumclaw water districts  I closed between 236Th ave and 2 Sakai as break down roller on 6 v t / driveways.	D-110HF # 810, Sakai GW 750 # 822 Profice Jeanne:  SONNEL ON PROJECT:  dworth: 1- Project Manager( Scott Droppeter ( Luke Dillard), I — Screed operator ( Ser ( Dave Thorton, Penny Cochran), 1 — Fers( Glen, Katy, Ray and Paula), 1- Q.C. a Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatters: Warren (Enumclaw water district), Hersel County: Joe(Lab), Jim Eagan, Kris Beatters: Warren (Enumclaw water district), Hersel Colored between 236Th ave and 212th at Sakai as break down roller on 6 vibes, Date of driveways.	D-110HF # 810,Sakai GW 750 # 822 Pneumatical Jeanne:  SONNEL ON PROJECT:  dworth: 1- Project Manager( Scott Droppelmannetor ( Luke Dillard), I – Screed operator ( Jonather ( Dave Thorton, Penny Cochran), 1 – Raker ( Jers( Glen, Katy, Ray and Paula), 1- Q.C ( Rene la Jeanne:  County: Joe(Lab),Jim Eagan,Kris Beatty (DNFrs: Warren (Enumclaw water district), Herb( WS)  closed between 236Th ave and 212th ave. Flat Sakai as break down roller on 6 vibes, DD-110 to driveways.  Derature of laid down mix ranged from 270 deg.	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller ia Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/Nator ( Luke Dillard), I – Screed operator ( Jonathan Pullater ( Dave Thorton, Penny Cochran), 1 – Raker ( Ludvig Jers ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Waltor ia Jeanne:  County: Joe(Lab),Jim Eagan,Kris Beatty (DNR).  rs: Warren (Enumclaw water district), Herb ( WSDOT)  c: d closed between 236Th ave and 212th ave. Flaggers at Sakai as break down roller on 6 vibes, DD-110 as interest / driveways.  Derature of laid down mix ranged from 270 deg. To 3000	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller), Ken wor a Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Anator ( Luke Dillard), I – Screed operator ( Jonathan Pullack), 2 – Refer ( Dave Thorton, Penny Cochran), 1 – Raker ( Ludvig Yefimov ), pers( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CT is Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  rs: Warren (Enumclaw water district), Herb( WSDOT)  c: Closed between 236Th ave and 212th ave. Flaggers at each major Sakai as break down roller on 6 vibes, DD-110 as intermediate roll of the driveways.  Derature of laid down mix ranged from 270 deg. To 300deg. Outside	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller ), Ken worth Water To a Jeanne:  SONNEL ON PROJECT:  dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1-  ator ( Luke Dillard), I – Screed operator ( Jonathan Pullack), 2 – Roller operator ( Dave Thorton, Penny Cochran), 1 – Raker ( Ludvig Yefimov ),1 – Tack Copers ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL)  a Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  rs: Warren (Enumclaw water district), Herb( WSDOT)  classification of the second	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller ), Ken worth Water Truck # 26, Final Jeanne:  ISONNEL ON PROJECT: Idworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1- Paver operator ( Luke Dillard), I - Screed operator ( Jonathan Pullack), 2 - Roller operators ( Shaneer ( Dave Thorton, Penny Cochran), 1 - Raker ( Ludvig Yefimov ), 1 - Tack Operator ( Lugers ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL)  In Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  In Street: Warren (Enumclaw water district), Herb( WSDOT)  In Closed between 236Th ave and 212th ave. Flaggers at each major crossing to stop call to sake as break down roller on 6 vibes, DD-110 as intermediate roller on 4 vibes, 2 statict / driveways.  In Sakai as break down mix ranged from 270 deg. To 300deg. Outside air temp. Was in the operature of laid down mix ranged from 270 deg. To 300deg. Outside air temp. Was in the	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller), Ken worth Water Truck # 26, Peter Bilt Tack in Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1- Paver operators( Al Andersotro ( Luke Dillard), I - Screed operator ( Jonathan Pullack), 2 - Roller operators ( Shane Thomas, William ( Dave Thorton, Penny Cochran), 1 - Raker ( Ludvig Yefimov ), 1 - Tack Operator ( Luke Edwards ) pers ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL) in Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  rs: Warren (Enumclaw water district), Herb ( WSDOT)  Closed between 236Th ave and 212th ave. Flaggers at each major crossing to stop cars entering in the Sakai as break down roller on 6 vibes, DD-110 as intermediate roller on 4 vibes, 2 static rolling patter at / driveways.  Derature of laid down mix ranged from 270 deg. To 300deg. Outside air temp. Was in the mid 80deg.	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller ), Ken worth Water Truck # 26, Peter Bilt Tack Truck in Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1- Paver operators( Al Anderson), alor ( Luke Dillard), I — Screed operator ( Jonathan Pullack), 2 — Roller operators ( Shane Thomas, Willie Guer ( Dave Thorton, Penny Cochran), 1 — Raker ( Ludvig Yefimov ), 1 — Tack Operator ( Luke Edwards ), 1- Tolers ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL) in Jeanne:  County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  rs: Warren (Enumclaw water district), Herb( WSDOT)  Closed between 236Th ave and 212th ave. Flaggers at each major crossing to stop cars entering in to work and a stream of the	D-110HF # 810,Sakai GW 750 # 822 Pneumatic Roller ), Ken worth Water Truck # 26, Peter Bilt Tack Truck # 9 (a Jeanne:  SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1- Paver operators( Al Anderson), 1- Shu ator ( Luke Dillard), I - Screed operator ( Jonathan Pullack), 2 - Roller operators ( Shane Thomas, Willie Guillen), ser ( Dave Thorton, Penny Cochran), 1 - Raker ( Ludvig Yefimov ), 1 - Tack Operator ( Luke Edwards ), 1- TCS ( Tollars ( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL)  (a Jeanne: County: Joe(Lab), Jim Eagan, Kris Beatty (DNR).  (b) (c) (c) (c) (c) (d) (d) (e) (e) (e) (e) (e) (e) (e) (e) (e) (e	SONNEL ON PROJECT: dworth: 1- Project Manager( Scott Droppelman), 1- F/M ( Dan Andreas), 1- Paver operators( Al Anderson), 1- Shuttle bugg ator ( Luke Dillard), I - Screed operator ( Jonathan Pullack), 2 - Roller operators ( Shane Thomas, Willie Guillen), 2- Truck er ( Dave Thorton, Penny Cochran), 1 - Raker ( Ludvig Yefimov ), 1 - Tack Operator ( Luke Edwards ), 1- TCS ( Tara), 4- ters( Glen, Katy, Ray and Paula), 1- Q.C ( Renee Walton from CTL)  a Jeanne: County: Joe(Lab), Jim Eagan, Kris Beatty (DNR). rs: Warren (Enumclaw water district), Herb( WSDOT)  classed between 236Th ave and 212th ave. Flaggers at each major crossing to stop cars entering in to work zone from 7a. Sakai as break down roller on 6 vibes, DD-110 as intermediate roller on 4 vibes, 2 static rolling pattern and DD-28 for Side to driveways.  Derature of laid down mix ranged from 270 deg. To 300deg. Outside air temp. Was in the mid 80deg.

INSPECTOR'S SIGNATURE:

#### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

#### **INSPECTORS DAILY REPORT Page 2 of 2**

DATE: Thursday September 24th 2009

- Day 3 Paving was from station 36+50 to 10+17. See I.D.R on 09/23/09 for skipping section. Section in between 63+10 to 36+50 will be paved on 09/25/09. Wood Worth haul mix from Lake View plant using 15 truck and trailers. Placed 894.36 Tons of HMA Class ½" PG 64-22 with 15% Rap on Se 416th st at 2" compacted. Placed 10 T of same mix as prelevel on SE 416TH ST.
- All trucks came in with covered loads.
- Prelevel section was on the South side from st # 36+75 to 43+00 (0" at centre to ½" at edge)
- Mat on South side had tear at st# 20+00. Contractor fixed with Sakai.
- Temp. Of mix on North side was 290 deg at 36+50, 285deg at 12+50. Begin temp. on South side was 272deg at 10+17, 285 deg at 11+50,300deg at 13+50. Temperature stayed within 5 deg. of 295deg. for rest of day. Temp. at st # 10+17 on the South side was a bit low because of mix sitting in the hopper.
- Talk to school principle at Elementary School. Advised her of change in plans of paving near school today instead of Friday. She was fine.
- Call from Tara (lab) that 1st mix sample passed.
- WSDOT core crew on site with Joe (LAB) to core mix that was placed on Day 2( mix had 3% RAS).
- Compaction was hard to achieve on the South side for last 1500.'

	Inspector(s) Time:	
White - Contract File		
Yellow - Project Engineer		
Pink - Inspector's Diary	Inspector's Signature:	



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709

Fax: (206) 296-0179

Project: SE 416t	h St Overlay, S	Shingles in Pa	ving Den	no. Project Number:	M	78030		
Contractor:	Woods	worth & Co.		Contract Number:	C00	4555C0	9	
Asphalt Supplier:	Wood	worth Lakev	iew	Sampling Location:		Bed @		
Oil Source and Gi	rade:	U.S. Oil		Collection Date/Time:		09 @ 7:0		
Mix ID: MD	090088	Sam	ple ID:	KC-09-1261	HMA Class		1/2	
Gı	radation (AASH	TO T 30)		Volun	netrics (AASHT)	O T 312)		
Sieve Size	% Passing	Toleran		TV / 52			Tolera	
Sieve Size	70 Fassing	*LL	*UL	% Va @ Ndes	2.2	*LL 2.5	to	*UL 5.5
1 1/2"	f	to		% VMA @Ndes	13.3	12.5	- to -	N/A
1"		to	-	% VFA @ Ndes	83.5	65		75
3/4"	100	99 to	100	Dust/Asphalt Ratio	1,4	0.6	- <sup>to</sup> -	
1/2"	92	90 to	100	Gmm (WSDOT FOP for			_ to _	1.6
3/8"	83	78 to	90	Gmb (ASTM D	·	2.481	- 1	54.4 lb/ft <sup>3</sup>
#4	57	to		Asphalt Content % (KC		2.426		
#8	38		43					5.7
			43	% Water (WSDOT FOP)	OF AASH 10 1 329)	0.12		2.0 max
#16	26	to			_			
#30	18	to		Mix Temperature in °		338	<b>-</b>	
#50	13	to		Oil Temperature in °F		330		
#100	9	to		Air Temperature in °F		54	_	
#200	6.5	4.3 to	7.0					
				*LL=Lower Limit UL	=Upper Limit			
			Data fro	m Mix Design				
Aggregate So	urce B-333	B-160	0	Gb (Binder)		1.028		
Asphalt Conte		5.6%		Mixing Temperature	n °F	313	-	
Anti Strip		0.00%	_	Compaction Tempera		291	=:	
Pbe		4.5		Number of Gyrations		8	-	
Gsb (Aggregat	e Blend)	2.64		Number of Gyrations		100	-	
Gsb (Fine Agg		2.599	_	ESAL'S (millions)	@ Design	3	-	<b>-20</b>
	regate)	2.599	_	LOAL 3 (IIIIII0II3)		3	- <sup>to</sup> -	<30
Remarks: Sample was obtained by #245183. This truck was RAP. Ignition Furnace Ca	the 3rd load of the d	ay. The accumula	tive tonage w	on ssmple was taken by Woodwortl vas 96.23. This is the first of two sa	n. Sample was obtai amples to be taken to	ined from troday. This	uck #87 mix con	'-157, ticket Itains 15%
Material  Approved for Distribution By:	X meet	to meet			4/2009 Date	Copies	Resid Const	bution lent Engr. . Admin. Engineer
Form: HMA - Test	Results			While of	19/09	Re	vised: 4/	(22/08



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709

Fax: (206) 296-0179

#### **Ignition Furnace Worksheet** Project: SE 416th St Overlay, Shingles in Paving Demo Project Number: M78030 Woodworth & Co. C004555C09 Contract Number: Contractor: Truck Bed @ Plant Sampling Location: Woodworth Lakeview Asphalt Supplier: Collection Date/Time: 9/24/09 @ 7:09 AM U.S. Oil Oil Source and Grade: 1/2" HMA Class: MD090088 Sample ID: KC-09-1261 Mix ID: **Moisture Content (WSDOT FOP for AASHTO T329)** After 90 min. After 120 min. Initial 10:49 8:49 10:29 Time 513.8 513.8 513.8 Tare Weight Mass (Wt.) H2O 1242.3 0.9 1242.4 1243.2 Sample + Tare Wt. 728.6 728.5 Percent H<sub>2</sub>O 0.12 729.4 Sample Weight Ignition Furnace Data (AASHTO T 308) Ignition Furnace ID: TIKI 3010.4 Mass of Empty Basket(s): Mass of Baskets and Sample: 4855.6 5.7 Actual Asphalt Content in %: Mass of Sample: 1845.2 Mix Design Asphalt Content in %: 5.6 0.53 Calibration Factor (Ticket) in %: 4737.3 Mass of Residual Agg. & Basket: Percent Loss (Ticket) in %: 6.56 Mass of Residual Agg. (Direct): 1726.9 0.16 Temperature Compensation (Ticket) in %: Mass of Residual Agg. (Ticket): 1727.1 5.87 Calibrated Asphalt Content (Ticket) in %: Difference of Masses of Residual Aggregate - Direct vs. Ticket = 0.0% Specification: shall be within +0.1%. Sieve Analysis (AASHTO T30) 1624.9 Mass of Dry Washed Residual Aggregate: **Control Points** Tolerance Accumulative Sieve Size **JMF** Upper Percent Passing Upper Lower Lower \*Record all sieves Weight Retained Limit Limit Limit Limit Sieve Size 1 1/2" 1" 100 100 99 100 100 100 0.0 3/4" 90 90 100 100 94 1/2" 133.1 92 83 84 78 90 0 90 288.5 3/8" 57 57 736.8 #4 38 39 35 43 28 58 1069.4 #8 27 26 1274.3 #16 19 18 1407.7 #30 13 13 1503.2 #50 8 9 1567.3 #100 2.0 7.0 7.0 6.5 4.3 1614.0 #200 Pan 1624.7 Specification: shall be within ± 0.2% Difference of Masses - Pan vs. Washed = 0.0% Red = Outside Tolerance Limit Black Italic - At Tolerance Limit **Bold = Within Tolerance Limits** Sample was obtained by King County Representative Tara Pfaff. A companion ssmple was taken by Woodworth. Sample was obtained from truck #87-157, ticket #245183. This truck was the 3rd load of the day. The accumulative tonage was 96.23. This is the first of two samples to be taken today. This mix contains 15% RAP. Ignition Furnace Calibration Factor changed from 0.63 to 0.53.

fails to meet

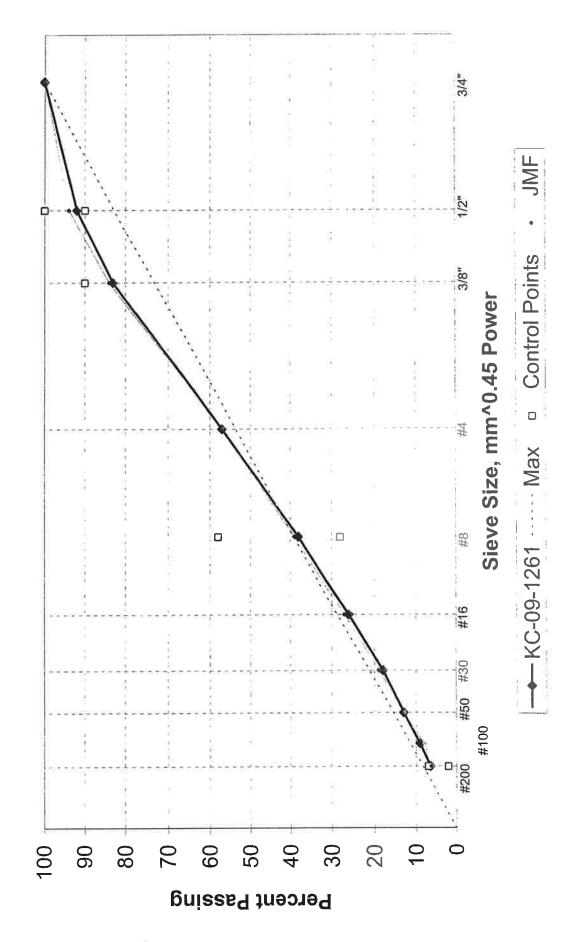
Revised: 4/22/08

above specifications.

Material

X

meets



Form: HMA - 0.45 Gradation Chart

# KC-09-1261

			Plant In	formation				
Sampling Location	Truck	Bed @ Plant	Mix Temp	338				
Collection Date/Time		9 @ 7:09 AM	Oil Temp	330			×	
Sample ID		-09-1261	- Air Temp	54				
		G	yratory Data	(AASHTO T	312)			
Initial wt. of Uncompac	cted mix.		4800.0					
Height in mm of Samp	le @ Initial (	Syrations	126.2	8		Compaction	Temp. =	291
Height in mm of Samp	le @ Design	Gyrations	114	100				
		Ign	ition Furnace	(AASHTO	Г 308)			
Mass of Empty Bask	et	3010.4	-:	Percent Lo	ss (Ticket	) in %:	6.56	_
Mass of Basket & Sa	mple	4855.6	_	Temp. Con	np. (Ticket	) in %:	0.16	_ Oil:
Sample Weight		1845.2	£.	Ignition Fu	rnace ID:		TIKI	_
Calibration Factor in	<b>%</b> :	0.53	-	Mass of Re	es. Agg. &	Bask.	4737.3	_ 5.7
		Moisture Co	ontent (WSDC	OT FOP for A	ASHTO T	329)		
Tare Weight	513.8	<b>-</b> :	4		Min. test s	sample 500g.		
Sample + Tare Wt.	1243.2	Time	8:49	_,	163 +/- 14	° C for the ove	en temp.	
Sample + Tare Wt.	1242.4	After 90 min.	10:29					Moist %:
Sample + Tare Wt.	1242.3	After 120 min.	10:49	_(Use Milita	ry Time, e	x. 00:00)		0.12
			Rice Data (	ASTM D 2041	1)			
					30 mm or	less Hg at 15	min.	
Sample Mass			1520.0					
Mass of Pycnometer	Under Wa	ter @ 25.0 °C	1277.5	- 1		Min. Mass		RICE:
Pycnometer Calibrat	ion @ 77°F			_	1/2"	1500g		154.4
Mass of Sample & Py	cnometer	Under Water	2184.8	_	3/4"	2000g		
Temperature of Water	er 25.0 ± 1.0	) °C	25.2	_	1"	2500g		
Sieve Analys	is (AASHT	O T 30)			В	ulk Specific G	Bravity	
Mass of Dry, Washed	d Sample	1624.9	<b>-</b> y					
1 1/2"	<del>-</del> #8	1069.4	<b>-</b> 0	18/-1-1-4 :	A :			
1"	#16 -	1274.3	<u> </u>	Weight in			788	==
3/4" 0.0	#30	1407.7	•	Weight in \			318.7	_
1/2" 133.1	#50	1503.2	-	Weight SS			792.6	
3/8" 288.5	#100	1567.3	9	Temp 25.0	± 1.0 °C	2	25.0	=
#4 736.8	#200	1614.0	e.					
Pan	1624.7	•						

# King County HMA Volumetric Worksheet

155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709

Fax: (206) 296-0179

Project:	SE 416th St Overlay,	Shingles in Paving	<b>Demo</b> Project Number:	C004	555C09
Mix ID:	MD090088	Sample ID:	KC-09-1261	HMA Class:	1/2"

Mix ID:	MD090088	Sample ID:	KC-09-1261	HMA Class:	1/2"
		Red	quired Data		
Percent Bind	ler (Pb)				5.7
% Pass #200	) Sieve				6.5
3mm (Rice S	Specific Gravity)				2.481
Compaction	Temperature in °F				291
nitial Weight	t of Uncompacted Mixture	е			4800.0
Number of G	yrations @ Initial				8
Number of G	yrations @ Design				100
Gb (Specific	Gravity of the Binder)				1.028
Gsb (Bulk Sp	pecific Gravity of the Agg	regate Blend)			2.64
	Thero	retical Maximum Spec	ific Gravity "Gmm" (A	STM D 2041)	
N) Sample I	Mass				1520
	Pycnometer Under Wate	r			1277.5
	eter Calibration @ 77°F				
	Sample & Pycnometer U	nder Water			2184.8
	iture of Water in °C				25.2
	eter Calibration @ Test T	emperature			
Company of the second s	Thermal Correction				
	nermal Correction				0.99995
	25°C = N*U/(N-(Q-O))				2.481
,	@ 25°C = V*62.245 lb/f	t <sup>3</sup>	**************************************		154.4
		Commence of the contract of th	vity "Gmb" (ASTM D27	726)	
A = Mass in	Grams of Specimen in A		, , , , , , , , , , , , , , , , , , ,		4788
101	Grams of Surface-Dry S				4792.6
	Grams of Specimen in V				2818.7
	of the Water °C				25.0
	ature Correction for Dens	sity of Water			1.0000
Gmb =D A /			<del></del>	(nearest 0.001)	2.426
	= ((B-A) / (B-C))*100			(nearest 0.001)	0.233%
		Gyratory Compac	ctor Data (AASHTO T 3	312)	
H @ Nini (He	eight of Sample @ Initial	Gyrations)			126.2
H @ Ndes (H	Height of Sample @ Des	ign Gyrations)			114
% Gmm @ I	v ini = (Hdes*Gmb)/(Hin	ni*Gmm)*100		(nearest 0.1)	88.3
% Gmm @ l	N des = (Gmb)/(Gmm)*1	00	2411.0000	(nearest 0.1)	97.8
		Air Voids (Va) {W	SDOT Std. Spec. 9-03	.8(7)}	
Va = 100 *(1	-(Gmb/Gmm))	JMF Toleran	ce = 2.5% to 5.5%	(nearest 0.1)	2.2
	Voids in	n Mineral Aggregate (V	/MA) {WSDOT Std. 5	Spec. 9-03.8(7)}	
VMA = 100 '	*(1-(Gmb*Ps/(Gsb*100))	)) Mix Criteria	a = Min. 14.0%	(nearest 0.1)	13.3
	Voids	Filled With Asphalt (V	FA) {WSDOT Std. S	pec. 9-03.8(7)}	
VFA = 100 *	[(VMA - Va) / VMA]	Mix Criter	ria = 65 to 75	(nearest 0.1)	83.5
	Dus	st / Asphalt Ratio (D/A	) {WSDOT Std. Spec	c. 9-03.8(2)}	
Gse = (100 -	- Pb) / [(100 /Gmm) - (Pb			(nearest 0.001)	2.713
	Gb)*(Gse-Gsb)/(Gse*Gsb			(nearest 0.1)	4.7
P <sub>s</sub> = 100 - P				(nearest 0.1)	94.3
TO STREET THE WORLD STATE					



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King County
Mix Design Requirements and Specifications

Asphalt Supplier: Woody Oil Source: U.	orth & Co. vorth Lakevie S. Oil	w	Contract Number: Mix ID: MD0900		555C09	
Oil Source: U.		w	Mix ID: MD0900	.00		
Oil Source: U.	S. Oil		WIN ID. HIDOUG	AIVIN 000	Class: _	1/2"
			Resident Engineer:	Fran	k Overt	on
	<u> </u>	Gradation				
,	Contractor JMF			Co	ntrol Po	ints
Sieve Size	% Passing		Tolerances		Class 1/2	
		*LL	*UL	LL		UL
1 1/2"						
1"						Vere
3/4"	100	99	100	100		100
© 1/2"	94	90	100	90		100
3/8"	84	78	90	0		90
#4	57	52	62			
#8	39	35	43	28		58
#16	27					
#30	19					
#50	13					
#100	8					
#200	6.3	4.3	7.0	2.0		7.0
Aggregate Source (Pit #)	B-333	B-160				
Binder Grade (PG)	64-22	ESAL	'S (millions)	3	to	<30
% Asphalt Content Design	5.6	***************************************		5.1%	to	6.1%
% Anti Strip	0.00	***************************************				
% Water				**************************************		2% max
% Va @ Ndes C	3.7			2.5	to	5.5
% VMA @Ndes C	14.3			14	to	N/A
% VFA @ Ndes C	74			65	to	75
Dust/Asphalt Ratio C	1.4			0.6	to	1.6
Pbe C	4.5					
Gmm S	2.463	SE S	pecification			45
Gmb S	2.374	Fract	ıre	Single face		90%
				Double face		
Gsb (Aggregate Blend) S	2.640	Fine A	Aggregate Angularity			44% min.
Gsb (Fine Aggregate) S	2.599					
Gb (Binder) S	1.028					
Mixing Temperature in °F	313					
Max. Mixing Temperature in °F	350					
Compaction Temperature in °F	291					
Number of Gyrations @ Initial	8			С	opies Di	stribution
Number of Gyrations @ Design	100			<u></u>	2 Re	sident Engr.
Number of Gyrations @ Max.	160			-	1 Co	nst. Admin.



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			HATTIPA I	rear incoming				
				no. Project Number:		78030		
Contractor:		worth & Co.		Contract Number:		04555C09		
Asphalt Supplie		worth Lakes		Sampling Location: _		Bed @ I		
	Grade:			Collection Date/Time:		09 @ 11:		
Mix ID: M	D090088	Saı	mple ID:	KC-09-1265	HMA Clas	ss:	1/2"	1
	Gradation (AASH	TO T 30)		Volun	netrics (AASHT	O T 312)		
<u>,                                    </u>							Tolera	nces
Sieve Size	% Passing	Tolera		0/ \/o @ Ndoo	0.4	*LL	7	*UL
1 1/2"		*LL	* <b>UL</b>	% Va @ Ndes	2.4	2.5	- to -	5.5
1"		7. 1		% VMA @Ndes	13.1	12.5	- <sup>to</sup> -	N/A
3/4"	100	99 to		% VFA @ Ndes	81.7	65	- <sup>to</sup> -	75
1/2"	95	90 to		Dust/Asphalt Ratio Gmm (WSDOT FOP for	1.4	0.6	= to _	1.6
3/8"	84			***************************************		2.485	15	4.7 lb/ft <sup>3</sup>
	57			Gmb (ASTM D		2.426	3	
#4	37	to to		Asphalt Content % (KC				5.4
#8		35 to		% Water (WSDOT FOP)	ror AASH1O 1 329)	0.19		2.0 max
#16	26	t(			_			
#30	18	to		Mix Temperature in °	F	310		
#50	13	to		Oil Temperature in °f		330	=	
#100	9	to		Air Temperature in °F		71	2	
#200	6.4	4.3 to	7.0					
				*LL=Lower Limit UL	=Upper Limit			
			Data fro	m Mix Design				
Aggregate S	Source B-333	B-160	0	Gb (Binder)		1.028		
Asphalt Cont		5.69		Mixing Temperature	in °F	313	-	
Anti Strip		0.00		Compaction Tempera		291	-	
Pbe		4.5		Number of Gyrations		8	_	
Gsb (Aggreg	ate Blend)	2.64		Number of Gyrations	+	100		
Gsb (Fine Ag		2.59		ESAL'S (millions)		3	to	<30
	7.5						- "-	
#245284. This truck w	by King County Repres as the 19th load of the mace Calibration Facto	day. The accun	nulative tonage	on ssmple was taken by Woodwort was 608.43. This is the second of	n. Sample was obta two samples to be	ained from tr taken today.	uck #92 This m	-152, ticket ix contains
Material Approved for	fails	s to meet		specifications.	4/2000	Copies 2 1	Const.	ent Engr. Admin.
Distribution By:	Materials Enginee	r	Date	-	14/2008 Date ST 12/9/1	<u>_1</u> 9	Dens.	Engineer

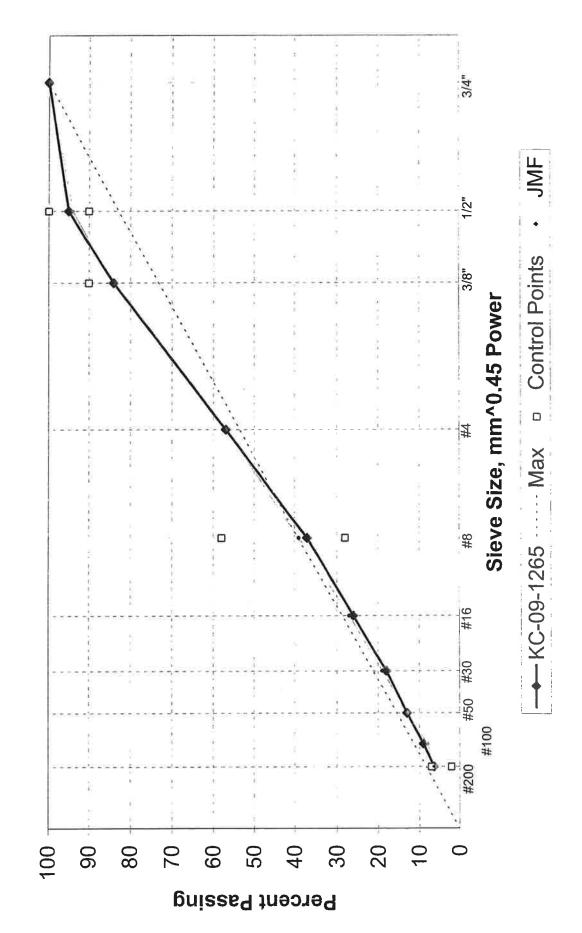


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#### Project: SE 416th St Overlay, Shingles in Paving DemoProject Number: M78030 C004555C09 Woodworth & Co. Contract Number: Contractor: Woodworth Lakesview Sampling Location: Truck Bed @ Plant Asphalt Supplier: Collection Date/Time: U.S. Oil 9/24/09 @ 11:49 AM Oil Source and Grade: 1/2" MD090088 Sample ID: KC-09-1265 HMA Class: Mix ID: **Moisture Content (WSDOT FOP for AASHTO T329)** After 90 min. After 120 min. Initial 2:29 3:05 Time 12:57 510.0 510.0 510.0 Tare Weight 1402.1 Mass (Wt.) H<sub>2</sub>O 1.7 1402.2 1403.8 Sample + Tare Wt. 892.1 Sample Weight 893.8 892.2 Percent H<sub>2</sub>O 0.19 Ignition Furnace Data (AASHTO T 308) Mass of Empty Basket(s): 3010.4 Ignition Furnace ID: TIKI Mass of Baskets and Sample: 4709.5 5.4 Actual Asphalt Content in %: Mass of Sample: 1699.1 0.53 Mix Design Asphalt Content in %: 5.6 Calibration Factor (Ticket) in %: 6.34 Mass of Residual Agg. & Basket: 4603.9 Percent Loss (Ticket) in %: Mass of Residual Agg. (Direct): 1593.5 Temperature Compensation (Ticket) in %: 0.18 5.63 Mass of Residual Agg. (Ticket): 1594.4 Calibrated Asphalt Content (Ticket) in %: Difference of Masses of Residual Aggregate - Direct vs. Ticket = 0.1% Specification: shall be within ±0.1%. Sieve Analysis (AASHTO T30) 1499.3 Mass of Dry Washed Residual Aggregate: Control Points Tolerance Accumulative Sieve Size **JMF** Percent Passing Upper Upper Lower Lower \*Record all sieves Weight Retained Limit Limit Limit Limit Sieve Size 1 1/2" 1" 100 99 100 100 100 3/4" 0.0 100 90 100 90 100 94 95 1/2" 76.2 84 78 90 0 90 3/8" 261.2 84 57 57 #4 692.3 43 28 37 39 35 58 #8 1001.7 26 27 1186.0 #16 18 19 1304.4 #30 13 13 #50 1388.3 9 8 1446.5 #100 7.0 2.0 7.0 6.3 4.3 6.4 #200 1491.0 1499.3 Pan 0.0% Specification: shall be within ± 0.2% Difference of Masses - Pan vs. Washed = Red = Outside Tolerance Limit Black Italic - At Tolerance Limit **Bold = Within Tolerance Limits** Sample was obtained by King County Representative Tara Pfaff. A companion sample was taken by Woodworth. Sample was obtained from truck #92-152, ticket #245284. This truck was the 19th load of the day. The accumulative tonage was 608.43. This is the second of two samples to be taken today. This mix contains 15% RAP. Ignition Furnace Calibration Factor changed from 0.63 to 0.53. fails to meet above specifications. Material X meets

1/2 Inch HMA



Form: HMA - 0.45 Gradation Chart

# KC-09-1265

			Plant In	formation				
Sampling Location	Truck B	Bed @ Plant_	_Mix Temp	310				
Collection Date/Time	9/24/09	@ 11:49 AM	_Oil Temp	330				
Sample ID	KC-	09-1265	_Air Temp	71				
		G	yratory Data	(AASHTO T	312)			
Initial wt. of Uncompa	cted mix.		4800.0					
Height in mm of Samp	ole @ Initial G	yrations	125.9	8		Compaction	Temp. =	291
Height in mm of Samp	le @ Design (	Gyrations	113.4	100				
		lgı	nition Furnace	(AASHTO T	Г 308)			
Mass of Empty Bask	<b>cet</b>	3010.4		Percent Lo	ss (Ticket)	) in %:	6.34	
Mass of Basket & Sa	ample	4709.5	- G	Temp. Con	np. (Ticket	) in %:	0.18	Oil:
Sample Weight		1699.1	_	Ignition Fu	rnace ID:		TIKI	_
Calibration Factor in	ı %:	0.53	_	Mass of Re	s. Agg. &	Bask.	4603.9	5.4
		Moisture Co	ontent (WSD)	OT FOP for A	ASHTO T	329)		
Γare Weight	510.0				Min. test s	sample 500g.		
Sample + Tare Wt.		Time	12:57		163 +/- 14	° C for the ove	en temp.	
Sample + Tare Wt.	1402.2	After 90 min.	2:29					Moist %:
Sample + Tare Wt.	1402.1	After 120 min.	3:05	(Use Milita	ry Time, ex	x. 00:00)		0.19
			Rice Data (	ASTM D 2041	1)			)
					30 mm or	less Hg at 15	min.	
Sample Mass			1569.5	_			r	
Mass of Pycnometer	Under Wate	er @ 25.0 °C	1277.5	_ ,		Min. Mass		RICE:
Pycnometer Calibrat	tion @ 77°F		-	_	1/2"	1500g		154.7
Mass of Sample & Py	ycnometer l	Jnder Water	2215.4	_	3/4"	2000g	E .	
Temperature of Wate	er 25.0 ± 1.0	°C	24.8	_	1"	2500g	:	
Sieve Analys	sis (AASHTO	O T 30)			В	ulk Specific G	Gravity	
Mass of Dry, Washed	d Sample	1499.3						
1 1/2"	_ #8	1001.7	-					
1"	#16	1186.0	-	Weight in A	Air	47	78.7	_
3/4"0.0	_ #30	1304.4	-	Weight in V	<b>Vater</b>	28	312.2	_
<b>1/2"</b> 76.2	#50	1388.3	-	Weight SS		47	'82.3	_
3/8" 261.2	#100	1446.5	-	Temp 25.0	± 1.0 °C	2	25.0	_
#4692.3_	#200	1491.0	-					
Pan	1499.3							

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mar volumente von A	
Project: SE 416th St Overlay, Shingles in Paving Demo Project	ct Number: <b>C004555C09</b>
Mix ID: MD090088 Sample ID: KC-09-12	65 HMA Class: 1/2"
Required Data	
Percent Binder (Pb)	5.4
% Pass #200 Sieve	6.4
Gmm (Rice Specific Gravity)	2.485
Compaction Temperature in °F	291
Initial Weight of Uncompacted Mixture	4800.0
Number of Gyrations @ Initial	8
Number of Gyrations @ Design	100
Gb (Specific Gravity of the Binder)	1.028
Gsb (Bulk Specific Gravity of the Aggregate Blend)	2.64
Theroretical Maximum Specific Gravity "G	mm" (ASTM D 2041)
(N) Sample Mass	1569.5
(O) Mass of Pycnometer Under Water	1277.5
(P) Pycnometer Calibration @ 77°F	
(Q) Mass of Sample & Pycnometer Under Water	2215.4
(R) Temperature of Water in °C	24.8
(S) Pycnometer Calibration @ Test Temperature	
(T) Bitumen Thermal Correction	
(U) Water Thermal Correction	1.00005
(V) Gmm @ 25°C = N*U/(N-(Q-O))	2.485
(W) Density @ 25°C = V*62.245 lb/ft 3	154.7
Bulk Specific Gravity "Gmb" (As	TM D2726)
A = Mass in Grams of Specimen in Air	4778.7
B = Mass in Grams of Surface-Dry Specimen in Air	4782.3
C = Mass in Grams of Specimen in Water	2812.2
Temperature of the Water °C	25.0
D = Temperature Correction for Density of Water	1.0000
Gmb =D A / (B-C)	(nearest 0.001) 2.426
Absorption = ((B-A) / (B-C))*100	(nearest 0.001) 0.183%
Gyratory Compactor Data (AAS	HTO T 312)
H @ Nini (Height of Sample @ Initial Gyrations)	125.9
H @ Ndes (Height of Sample @ Design Gyrations)	113.4
% Gmm @ N ini = (Hdes*Gmb)/(Hini*Gmm)*100	(nearest 0.1) 87.9
% Gmm @ N des = (Gmb)/(Gmm)*100	(nearest 0.1) 97.6
Air Voids (Va) {WSDOT Std. Sp	ec. 9-03.8(7)}
Va = 100 *(1-(Gmb/Gmm))	
Voids in Mineral Aggregate (VMA) {WSDC	T Std. Spec. 9-03.8(7)}
VMA = 100 *(1-(Gmb*Ps/(Gsb*100)))	(nearest 0.1) 13.1
	Std. Spec. 9-03.8(7)}
VFA = 100 * [(VMA - Va) / VMA]	(nearest 0.1) 81.7
	d. Spec. 9-03.8(2)}
Gse = (100 - Pb) / [(100 /Gmm) - (Pb / Gb)]	(nearest 0.001) 2,704
Cse = (100 - Pb) / [(100 /Glillin) - (Pb / Gb)]	
$P_s = 100 - Pb$	
D/A = % Passing #200 Sieve / Pbe Mix Criteria = 0.6 to 1.6	(nearest 0.1) 1.4

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Project: SE 416th St	Overlay, Sh	ingles in Paving		oject Number:		8030	
Contractor:		orth & Co.	Co	ontract Number:		4555C0	9
Asphalt Supplier:	Woody	vorth Lakesview	Mix	(ID: MD09008	38 HMA	Class:	1/2"
Oil Source:	U.	S. Oil	Res	sident Engineer:	Fran	k Over	ton
			Gradation				
		Contractor JMF			С	ontrol P	oints
Sieve Size		% Passing		ances	812	Class 1	
19			*LL	*UL	LL		UL
1 1/2"							
1"							
3/4"		100	99	100	100		100
1/2"		94	90	100	90		100
3/8"		84	78	90	0		90
#4		57	52	62			
#8		39	35	43	28		58
#16		27					
#30	nate in the contraction of the c	19					
#50	OPERIES-COOPERIES-COOPER	13					
#100		8					
#200		6.3	4.3	7.0	2.0		7.0
Aggregate Source (Pit	±1)	B-333 E	3-160				
Binder Grade (PG)		64-22	ESAL'S (m	— illions)	3	to	<30
% Asphalt Content De	sian	5.6			5.1%	to	6.1%
% Anti Strip		0.00					•
% Water							2% ma
% Valer % Va @ Ndes	С	3.7	•••••		2.5	to	5.5
% VMA @Ndes	С	14.3	***************************************		14	— to	N/A
% VFA @ Ndes	C	74			65	— to	75
Dust/Asphalt Ratio	C	1.4			0.6	to	1.6
Pbe	C	4.5					
Gmm	S	2.463	SE Specific	cation			45
Gmb	S	2.374	Fracture		Single face		90%
GIID	Care	2.014			Double face		•
Gsb (Aggregate Blend	d) S	2.640	Fine Aggre	egate Angularity			44% mi
Gsb (Fine Aggregate)		2.599		.X			
Gb (Binder)	S	1.028					
Mixing Temperature in		313					
Max. Mixing Tempera		350					29
Compaction Tempera		291					47.07
Number of Gyrations		1.8				Copies I	Distribution
Number of Gyrations		100				2 R	esident Engr
		160			-		onst. Admin.
Number of Gyrations	w IVIAX.	100					



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<b>—</b> — — — — — — — — — — — — — — — — —			gyreyate nesuits			
Project: SE	E 416th St Overla	ay	Project Number:	4-11	M78030	
Contractor:	Woodworth		Contract Number	-	C00455C09	
Name of Source: Mile	es Sand and Gra		Sampling Location		Plant/Belt	
Lab Sample Number:	KC-09-1		Collection Date:		24/2009 @ Afte	
Mix ID:MD090088	_ Pit #: <b>E</b>	3 <b>-333</b> S	ampled By:	TEP HM	A Class:	1/2"
	Sand	Equivalent	Test (AASHTO T	Γ-176)		
SE Value= S	and Reading (100	0)	Clay Reading	Sand Reading	g SE Value	
	Clay Reading		6	3.6	<sup>-</sup> 60	
	= =		Specification =	45 Min.		
Pe	rcentage of Fr	acture in Co	urse Aggregate	(AASHTO TE	P-61)	
P = Percent of fractu			s of questionable p		ieriine particies	
F = Mass of fracture	r i		of unfractured pa			
F2 2 3N7	Sieve Size	F	Q	N	Р	
$\left \left(F+\left(\frac{Q}{2}\right)\right)\right $	3/4"					
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right  *100$	1/2"	547.0	0.0	9.2	98	
7 + 2 + 7	3/8"	517.8 377.3	0.0	16.5	96	
E		175.9	0.0	3.7	98	
A 10	#4				36	
Specification		Face = 90 %	Double Fac		- 00 A\	
			Fine Aggregat		Г-304)	
	compacted Vo	id Content of	Fine Aggregat	e (AASHTO 1	<b>Γ-304)</b> avity fine agg. (G	<sub>b</sub> )
V = Volume of cylind	compacted Vo	id Content of	Fine Aggregat	e (AASHTO 1		
Und	rical measure, m	id Content of	Fine Aggregat	e (AASHTO 1 dry specific gra empacted voids	avity fine agg. (G	
V = Volume of cylind F = Net mass, g, of f	rical measure, m	id Content of	Fine Aggregat	e (AASHTO 1 dry specific gra empacted voids	avity fine agg. (G	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes  Sieve Size	compacted Vollrical measure, mine aggregate in street Sample	id Content of	G = Bulk U = Unco	e (AASHTO 1 dry specific gra empacted voids	wity fine agg. (G	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes  Sieve Size #8 - #16	Irical measure, mine aggregate in Mass	id Content of	G = Bulk U = Unco	e (AASHTO 1 dry specific gra empacted voids	avity fine agg. (G	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes  Sieve Size #8 - #16	drical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g	id Content of I measure Tare	G = Bulk U = Unco	e (AASHTO 7  dry specific gra  mpacted voids	avity fine agg. (Q <sub>s</sub> , percent, in the $ = \left[ \frac{V - (F/G)}{V} \right] *100 $	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes  Sieve Size #8 - #16 #16 - #30	Irical measure, management in the aggregate in the st Sample Mass 44 +/- 0.2 g	id Content of I measure Tare V	G = Bulk U = Unco	dry specific gra ompacted voids	evity fine agg. (G <sub>s</sub> , percent, in the $= \left[\frac{V - \left(F/G\right)}{V}\right] * 100$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50	drical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g 57 +/- 0.2 g 72 +/- 0.2 g	id Content of I measure Tare V 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph ompacted voids  G 2.599	avity fine agg. (G, percent, in the $= \left[\frac{V - (F/G)}{V}\right] *100$ $= \frac{U}{47.2}$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100	Irical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g 57 +/- 0.2 g 72 +/- 0.2 g 17 +/- 0.2 g	id Content of I measure Tare V 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the $= \left[\frac{V - (F/G)}{V}\right] *100$ $\frac{U}{47.2}$ $47.3$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100  Specification	Irical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g 57 +/- 0.2 g 72 +/- 0.2 g 17 +/- 0.2 g	id Content of I measure Tare V 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the $= \left[\frac{V - (F/G)}{V}\right] *100$ $\frac{U}{47.2}$ $47.3$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100  Specification	Irical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g 57 +/- 0.2 g 72 +/- 0.2 g 17 +/- 0.2 g	id Content of I measure Tare V 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the $= \left[\frac{V - (F/G)}{V}\right] *100$ $\frac{U}{47.2}$ $47.3$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100  Specification  Remarks:	Irical measure, maine aggregate in the Mass 44 +/- 0.2 g 57 +/- 0.2 g 17 +/- 0.2 g 44 Min.	id Content of I measure Tare V 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the $= \left[\frac{V - (F/G)}{V}\right] *100$ $\frac{U}{47.2}$ $47.3$	
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100 Specification  Remarks:	Irical measure, maine aggregate in the st Sample Mass 44 +/- 0.2 g 57 +/- 0.2 g 72 +/- 0.2 g 17 +/- 0.2 g	id Content of I measure  V 100.0 100.0	Fine Aggregat  G = Bulk  U = Unco  185.6  F  137.15  137.03	dry specific graph of the compacted voids  G  2.599  2.599	avity fine agg. (G <sub>s</sub> , percent, in the $= \left[\frac{V - \left(\frac{F}{G}\right)}{V}\right] * 100$ $\frac{U}{47.2}$ $\frac{47.3}{47}$	material
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100  Specification  Remarks:	rical measure, maine aggregate in standard Mass  44 +/- 0.2 g  57 +/- 0.2 g  72 +/- 0.2 g  17 +/- 0.2 g  44 Min.	id Content of I measure  V 100.0 100.0	Fine Aggregat  G = Bulk  U = Unco	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the $= \left[\frac{V - \left(\frac{F}{G}\right)}{V}\right] * 100$ $\frac{U}{47.2}$ $\frac{47.3}{47}$ Copies	material  Distribution
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100 Specification  Remarks:	Irical measure, maine aggregate in the Mass 44 +/- 0.2 g 57 +/- 0.2 g 17 +/- 0.2 g 44 Min.	id Content of I measure  V 100.0 100.0	Fine Aggregat  G = Bulk  U = Unco  185.6  F  137.15  137.03	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the expression of the expression	material  Distribution Resident Engr.
V = Volume of cylind F = Net mass, g, of f  Preparation of Tes Sieve Size #8 - #16 #16 - #30 #30 - #50 #50 - #100 Specification  Remarks:	rical measure, maine aggregate in standard Mass  44 +/- 0.2 g  57 +/- 0.2 g  72 +/- 0.2 g  17 +/- 0.2 g  44 Min.	id Content of I measure  V 100.0 100.0	Fine Aggregat  G = Bulk  U = Unco  185.6  F  137.15  137.03	dry specific graph of the compacted voids  G  2.599  2.599	evity fine agg. (G, percent, in the expression of the expression	material  Distribution

Department of Transportation Mbaterials Laboratory King County

Hot Mix Asphalt Compaction Form King County

155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

Woodworth Paving Co. Woodworth Plant Lakeview	Mix I.D. MD090088 Rand. #	2635.0 ft3 Lot Length to nearest 100 (A) 1190ft = V(ft.3) / V(ft) x D(ft.3) = 1190ft	ACP Test Te	Avg. Corr. Fact. Corrected Rice % of Rice	142.0 1.007 142.9 154.6 92.5	146.1 1.007 147.1 154.6 95.2	141.7 1.007 142.6 154.6 92.3	143.0 1.007 144.0 154.6 93.1	142.6 1.007 143.5 154.6 92.9	7 = 2635.0 ft3 Lot Length to nearest 100 (A) 1190ft	ACP Test Te	Avg. Corr. Fact. Corrected Rice % of Rice	142.0 1.007 142.9 154.6 92.5	142.4 1.007 143.4 154.6 92.8	145.5 1.007 146.5 154.6 94.7	143.2 1.007 144.2 154.6 93.3	142.6 1.007 143.5 154.6 92.9	Lot Avg. 93.2	Breakdown intermediate	Sakai GW 750 IR 110 HF	P DDV	4 Vibe 4 Vibe	
Prime		•	Enumclaw	adings	0.	89.	0.	6.	7	Vol. of ACP in Sublot $(V) = (S)/(O) = (S)/(O$	Enumclaw	sadings		0.	L:	80	6.		Rollers			Passes	
	Troxler 4640B #2659	200 Tons	700.	Gauge Readings	140.9 143.0	146.4 145.8	140.3 143.0	142.1 143.9	142.9 142.2	200 Tons Vol. o	700.	Gauge Readings	141.8 142.1	141.8 143.0	144.2 146.7	143.6 142.8	142.2 142.9						
Section		S)		Depth	0.17	0.17	0.17	0.17	0.17	Subior Size		Depth	0.17	0.17	0.17	0.17	0.17						
	Gauge	0.17ft Subjor Size	Sta. to Sta.	Offset	5.RT	7.5' RT	3.5' RT	8.5° RT	5.5' RT	0.17ft   Subio	Sta. to Sta.	Offset	3.5' RT	10' RT	6.5' RT	7'RT	4.5' RT						
ject 416th RAS Study No.	Wearing Start Air Temp. 48 End Air Temp. 72 (	0.0759 Tonsift3 Width $(W) = 13$ ft Depth $(D) = 0$	Sublot Ln. $[(A) \times 0.2] = (L)$ 238ft Sta. t	Test Location	35+85	33+50	31+25	29+10	27+00	0.0759 Tonsift3   Width (W) = $\begin{vmatrix} 13ft & Depth(D) = \\ 0 & 13ft \end{vmatrix}$	Sublot Ln. $[(A) \times 0.2] = (L)$ 238ft Sta. t		24+85	22+58	20+15	17+45	15+20	Field tests performed using KCDOT Test Method N-1.	510 #711				
9/24/09 Project	112" Lift We	Estimated Density $(\rho) = 0.0$	+	Location Code	Section #1	Estimated Density $(\rho) = 0.0$	+	Location Code	Section #1	Field tests perfor	Blaw Knox PF-5510 #711	511 1/2											
Date	Class	Estimated	Beg. Sta.	Test	-	2	3	4	က	Estimate	Beg. Sta.	Test	-	2	6	4	2		Pavers:	Remarks:			

Date 9/28/2009 Joe Karahuta Field Eng./Tester

Department of Transportation Mbaterials Laboratory King County



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

1 014 King County Hot Mix Asphait Compaction Form

Wearing         Start Air Temp.         48         End Air Temp.         72         Gauge         Troxler 4640B #2689           0.0759 Tons/ft3         Width (W) =   13ft   Depth (D) =   0.17ft   Sta. to Sta.         Sublot Ln. I(A) x 0.2] = (L)   238ft   Sta. to Sta.         Sublot Ln. I(A) x 0.2] = (L)   238ft   Sta. to Sta.         Offset   Depth   Depth (D) =   0.17ft   Sublot Ln. I(A) x 0.2] = (L)   318ft   Sta. to Sta.         Offset   Depth   Depth (D) =   0.17ft   A43.1   A43.	adings 2.2.6.6.6.6.6.6.6.6.0.0.0.0.0.0.0.0.0.0.	Enumclaw	Mix I.D.	MD090088	OUURR		
Width (W) =   13ft   Depth (D) =   0.17ft   Subiol Size   200 Ton					20000	Rand. #	
Ln. [(A) x 0.2] = (L)       238ft       Sta. to Sta.       Offset       Depth       Offset       Depth       Offset       Depth       Offset       Depth       Offset       Depth       Offset       Depth       Offset       Offset       Depth       Offset       Offset       Depth       Offset       Offset       Depth       Offset       Depth       Offset       Depth       Offset       Depth       De	90 and 100		2635.0 ft3		Lot Length to nearest 100' (A) = $V(R^3) / W(R) \times D(R) =$	OD (A)	1190ft
Test Location   Offset   Depth   142.7   142.7   143.1   144.3   144	and		ACP	ACP Test Temp.		# 107	13
12+88       9' RT       0.17       142.7         10+95       6' RT       0.17       143.1         11+00       8' LT       0.17       142.1         13+15       9' LT       0.17       142.8         15+50       3.5' LT       0.17       142.3         Ln. $I(A) \times 0.2I = (L)$ 238ft       Sta. to Sta.       Sta. to Sta.         Ln. $I(A) \times 0.2I = (L)$ 238ft       Sta. to Sta.       Sta. to Sta.         17+70       5' LT       0.17       142.1         20+00       9' LT       0.17       140.8			Avg. Co	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
10+95       6° RT       0.17       143.1         11+00       8° LT       0.17       142.1         13+15       9° LT       0.17       142.3         15+50       3.5° LT       0.17       142.3         Ln. $[(A) \times 0.2] = (L)$ 238ft       Sta. to Sta.       200 Ton         Ln. $[(A) \times 0.2] = (L)$ 238ft       Sta. to Sta.       Sta. to Sta.         17+70       5° LT       0.17       142.1         20+00       9° LT       0.17       140.8			142.4	1.007	143.4	154.6	92.8
			143.7	1.007	144.7	154.6	93.6
13+15       9·LT       0.17       143.8         15+50       3.5°LT       0.17       142.3         Width $(W) =   13ft   Depth (D) =   0.17ft   Sta. to Sta. $			143.5	1.007	144.5	154.6	93.4
$Width (W) =   13ft   Depth (D) =   0.17ft   Subiol Size   200 Ton     Width (W) =   13ft   Depth (D) =   0.17ft   Subiol Size     Ln. [(A) \times 0.2] = (L)   238ft   Sta. to Sta.                                      $			143.2	1.007	144.2	154.6	93.3
Width (W) =   13ft   Depth (D) =   0.17ft   Subict Size   200 Ton			142.7	1.007	143.6	154.6	92.9
Width (W) =   13ft   Depth (D) =   0.17ft   Statiol Size   200 Ton					Lot Avg.		93.2
Offset Depth 5°1.17 142.1 9°1.17 140.8		ublot (V) =	2635.0 ft3		Lot Length to nearest $100^{\circ}$ (A) = $V(R^3)$ / $W(R) \times D(R)$ =	(A) 50	1190ft
Offset Depth 5:LT 0.17 142.1 9:LT 0.17 140.8	700. Er	Enumclaw	ACP	ACP Test Temp.		# J07	14
5' LT 0.17 9' LT 0.17	Gauge Readings		Avg. Reading Cc	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
9. LT 0.17	141.6		141.9	1.007	142.8	154.6	92.4
	140.1		140.5	1.007	141.4	154.6	91.5
22+10 6.5' LT 0.17 142.6	144.0		143.3	1.007	144.3	154.6	93.3
24+38 3.5' LT 0.17 141.1	140.3		140.7	1.007	141.7	154.6	91.6
26+05 9'LT 0.17 140.3	141.4		140.9	1.007	141.8	154.6	91.7
Field tests performed using KCDOT Test Method N-1.					Lot Avg.		92.1
		Rollers	Breakdown		Intermediate		
			Sakai GW 750		IR 110 HF		
			۵		Vada		
		Passes	4 VIbe		4 Vibe		
		_		2	2-3 Static		
		Roller Codes:		SDV - Single Drum Vibrator	Vibrator	P-P	P-Pneumatic
Tester informed paying contractor and K.C. Inspector of the day's test results			DDV Do	DDV Double Drum Vibrator		TS - Tandem Steel	m Steel

9-24-09 RAP Lots 13 & 14

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

Last Revised: 1/7/2010



155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

 Date 9/24/09	Project	41	416th RAS Study	Study	No.		Sec	Section		Prime	Woodworth	th   Paving Co.	Co. Woodworth	rth   Plant	Lakeview
Class   112"   Lift	Wearing	Wearing Start Air Temp.	48	End Air Temp.	72	Gauge		Troxler 4640B #2659	10B #2659		Mix I.D.		MD090088	Rand.	#
Estimated Density $(\rho) =$	0.0759 T	0.0759 Tons/ft3 Widt	Width (W) =	13ft   Depth (D) =		0.17ft Su	Subiol Size (S)	200 Tons	8		2635.0 ft3		Lot Length to nearest $10^{\circ}$ (A) = $V(H^3)$ / $W(H) \times D(H)$ =	St 100" (A)   D(ft )=	1190ft
Beg. Sta. +		Sublot Ln. $[(A) \times 0.2] = (L)$	$)\times0.2J=(L$	.) 238ft	Sta	Sta. to Sta.			700.	Enumclaw		ACP Test Temp.	тр.	# 107	15
Location Code			Test Location	ation		Offset	Depth		Gauge Readings	ings	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
Section #1			28+75	2		6' LT	0.17	142.1	142.4		142.3	1.007	143.2	154.6	92.7
Section #1			31+18			4' LT	0.17	139.4	140.2		139.8	1.007	140.8	154.6	91.1
Section #1			33+00	0		e, LT	0.17	143.1	144.8		144.0	1.007	145.0	154.6	93.8
Section #1			34+52	2		6.5° LT	r 0.17	141.7	142.2		142.0	1.007	142.9	154.6	92.5
Section #1			35+87			7. LT	0.17	141.3	143.4		142.4	1.007	143.3	154.6	92.7
													Lot Avg.	١	92.5
Estimated Density (p) =	0.0759 Tons/ft3		Width (W) =	Depth (D)	= (a)	S	Subiol Size		Vol. of A	Vol. of ACP in Sublot $(V) = (S)/(a) =$	)=(	07	Lot Length to nearest $100^{\circ}$ (A) = $1/16^{\circ}$ ( $1/16^{\circ}$ ) $1/16/16$ $1/16^{\circ}$ ( $1/16^{\circ}$	st 100° (A)	
Beg. Sta. +		Sublot Ln. $[(A) \times 0.2] = (L)$	$(1 \times 0.2] = (1$	L) 238ft	Sta	Sta. to Sta.			700.		Ì	ACP Test Temp.	тр.	# 707	
Location Code						Offset	Depth		Gauge Readings	lings	Avg. Reading	Corr. Fact.	t. Corrected	Rice Density	% of Rice
Field tests p	peutormed	Field tests performed using KCDOT Test Method N-1.	Test Meth	od N-1.									Lot Avg.	, in	
Pavers: Blaw Knox PF-5510 #711	PF-5510 #7	11								Rollers	Breakdown	lown	Intermediate		
Remarks:											Sakai GW 750	W 750	IR 110 HF		ŧ
											۵.		DDV		
										Passes	4 Vibe	pe Pe	4 Vibe		
													2-3 Static		
										Roller Codes:		SDV - Single Drum Vibrator	um Vibrator	<u>ч</u>	P-Pneumatic
Tester informed paying contractor and K.C. Inspector of the	aving co	intractor and	d K.C. In	spector of t	he day	dav's test results	sults.				OO	DDV Double Drum Vibrator	um Vibrator	TS - Tan	TS - Tandem Steel
-	•			L	1										

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

## SE 416<sup>th</sup> Street Overlay: Shingles in Paving Demonstration

## **Construction Inspection and Quality Control Testing**

Paving Day 4 (9-25-09)

Inspectors Daily Report
HMA Test Results
HMA Mineral Aggregate Test Results
HMA Compaction Test Results

#### KING COUNTY DEPARTMENT OF TRANSPORTATION **CONSTRUCTION SERVICES SECTION**

## **INSPECTORS DAILY REPORT Page 1 of 2**

DATE: Friday September 25th 2009

Project No. M780	230 CONTRACT NO. C004	<b>55C09</b> Projec	T: <b>SE 416</b>	oth ST Overlay- Shingles Demonstration	in Paving
Inspector (s):	S.Shandil, M.Pavol	ka	CONTRACTOR:	Woodworth & Co.	mpany
WEATHER:	Clear		_	Темр: High <u>70</u>	Low65
WIND: Still X	Moderate X High			Workable 8	Nonworkable 0
SIGNS AND TRAFFIC CO	ONTROL CHECKED? Yes X	No		On-Site Interview? Yes	s No X
Work Done:					
operating Bla intermediate water to drop paving at 2.4 • Gloria Jea	7.30 begin paving South side from the side f	s screed operator. for d/ways and get de.11.30 begin pav n. Placed temp ta	Shane using Saka compaction.9.40 Er ving North side from	i as b/down roller with Willie open and paving at st# 63+10. Waited t st # 36+50 to 63+10. End pavi	erating DD-110HF a or 2hours,place ng at 2.40 pm. End
EQUIPMENT ON P	<b>PROJECT:</b> : 1- F/M work truck(Chevy 2500				0500 115 11 1001
1262),1 Bac I.R DD-110H Gloria Jean PERSONN Woodworth operator ( Lu spotter (Pen Ray and Pat Gloria Jean King Count Others: Her	k Hoe( JD 510 # 203),1- Shuttl IF # 810,Sakai GW 750 # 822 F ne: EL ON PROJECT: : 1- Project Manager( Scott Dro uke Dillard), I – Screed operator ny Cochran), 1 – Raker ( Ludvig ula), 1- Q.C ( Renee Walton froi ne: y: Joe(Lab)	e Buggy ( SB- 250 Pneumatic Roller ), ppelman), 1- F/M ( Jonathan Pullac g Yefimov ),1 – Ta	00B # 715), 1- Pave , Ken worth Water T ( Dan Andreas), 1- I k), 2 – Roller operat	r( Blaw Knox # 711), 3 Rollers( ruck # 26, Peter Bilt Tack Truck Paver operators( Al Anderson), tors ( Shane Thomas, Willie Gu	I.R DD-28HF # 847 x # 9 1- Shuttle buggy illen), 2- Truck
REMARKS:			<b>-</b> , , ,		
<ul> <li>Road closed from 7am to</li> </ul>	between 236Th ave and 2000 5pm.	East of 212th ave	e. Flaggers at each i	major crossing to stop cars ente	enng in to work zone
- Used Sakai	as break down roller on 6 vibes, and compaction	DD-110 as intern	nediate roller on 4 vi	ibes, 2 static rolling pattern and	DD-28 for Side
- Day 4 Pavin Tons of HM	g was from station 36+50 to 63- A Class ½" PG 64-22 with 15% i				ailers. Placed 865.11
- Temp. Of mi	nme in with covered loads. ix on South side was 270 deg a leg at 40+00, 292 deg at 40+50				side was 270 deg a
		Inspector	R(S) TIME:		
White - Contract File			-		
Yellow - Project Enginee Pink - Inspector's Diary	f	INSPECTOR	c's Signature:		

#### KING COUNTY DEPARTMENT OF TRANSPORTATION CONSTRUCTION SERVICES SECTION

### **INSPECTORS DAILY REPORT Page 2 of 2**

DATE: Friday September 25th 2009

- Call from Tara (lab) that 1st mix sample was 5.4 on oil & 7% on # 200, 2nd sample was 5.6 on oil and 7.2% on # 200.
- WSDOT core crew on site with Joe (LAB) to core mix that was placed today.(Mix had 3% RAS).
- Compaction was easy on Prelevel section South side from 36+50 to 43+00. It was difficult from 43+00 to 63+10.
- Removed pieces of wood, rubber, glass and wire from mat after been rolled.
- Contractor had to order more mix at end of day. Last load showed up after 45 Minutes.

	Inspector(s) Time:	
White - Contract File	,	
Yellow - Project Engineer Pink - Inspector's Diary	Inspector's Signature:	



155 Monroe Avenue NE, Bldg. D,
 Renton, WA 98056-4199
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Project: SE 416th St Overlay, Shingles in Paving Demo. Project Number: M78030 Contract Number: C004555C09 Woodworth & Co. Contractor: Truck Bed @ Plant **Woodworth Lakeview** Sampling Location: Asphalt Supplier: Collection Date/Time: 9/25/09 @ 6:47 AM Oil Source and Grade: U.S. Oil 1/2" KC-09-1268 HMA Class: MD090088 Sample ID: Mix ID:\_\_\_ Volumetrics (AASHTO T 312) Gradation (AASHTO T 30) Tolerances \*LL \*UL % Passing **Tolerances** Sieve Size % Va @ Ndes 4.3 2.5 5.5 \*LL \*UL 1 1/2" to % VMA @Ndes 14.7 12.5 N/A 1" to % VFA @ Ndes 70.7 65 75 1.6 1.6 3/4" 100 99 to 100 **Dust/Asphalt Ratio** 0.6 Gmm (WSDOT FOP for AASHTO T 209) 90 100 1/2" 95 2.489 154.9 lb/ft3 to 78 90 (ASTM D2726) 3/8" 87 Gmb 2.383 to Asphalt Content % (KCDOT FOP for AASHTO T 308) 61 to #4 5.5 % Water (WSDOT FOP for AASHTO T 329) 43 #8 42 35 to 0.15 2.0 max 29 #16 to 21 341 #30 to Mix Temperature in °F 15 to 330 #50 Oil Temperature in °F 11 45 #100 to Air Temperature in °F 7.0 7.0 4.3 to #200 \*LL=Lower Limit **UL=Upper Limit** Data from Mix Design 1.028 Gb (Binder) Aggregate Source 0 B-333 B-160 Mixing Temperature in °F 313 5.6% Asphalt Content Design Compaction Temperature in °F 291 Anti Strip 0.00% Number of Gyrations @ Initial 8 Pbe 4.5 Number of Gyrations @ Design 100 Gsb (Aggregate Blend) 2.64 3 ESAL'S (millions) <30 Gsb (Fine Aggregate) 2.599 to Remarks: Sample was obtained by King County Representative Tara Pfaff. A companion sample was taken by Woodworth. Sample was obtained from truck #91-162, ticket #245361. This truck was the 5th load of the day. The accumulative tonage was 160.01. This is the first of three samples to be taken today. This mix contains 15% RAP and 3% RAS. Ignition Furnace Calibration Factor changed from 0.63 to 0.53. X meets above specifications. Copies Distribution Material fails to meet Resident Engr. Const. Admin. Tested and Approved for Dens. Engineer 9/25/2009 Distribution By: Submitted by: Date Materials Engineer

Revised: 4/22/08

Whiter & War 1019/09

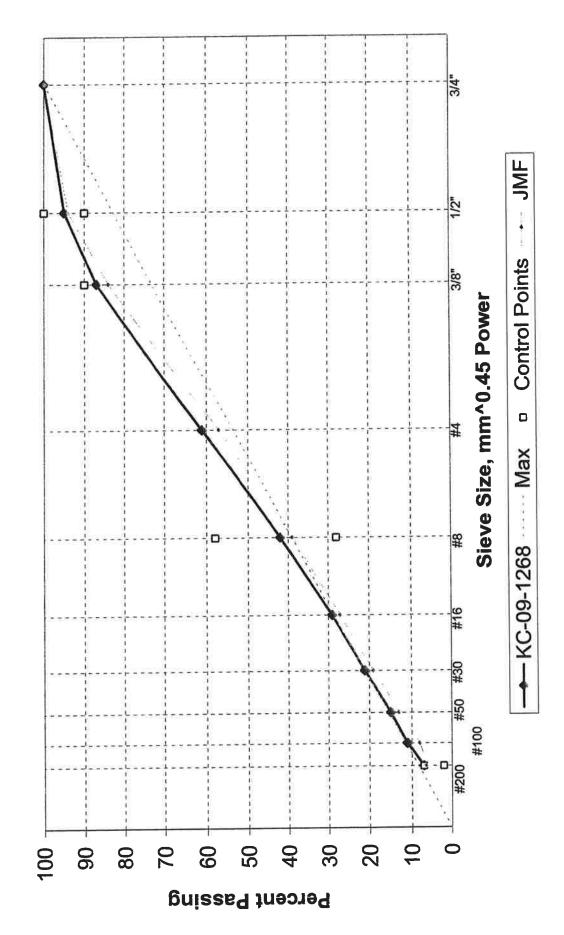
# ignition Furnace Worksheet

155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709

M78030

Fax: (206) 296-0179

Project: SE 416th St Overlay, Shingles in Paving DemoProject Number: Contractor: Woodworth & Co. Contract Number: C004555C09 Asphalt Supplier: Woodworth Lakeview Sampling Location: Truck Bed @ Plant U.S. Oil Collection Date/Time: 9/25/09 @ 6:47 AM Oil Source and Grade: MD090088 Sample ID: KC-09-1268 **HMA Class:** 1/2" Mix ID: Moisture Content (WSDOT FOP for AASHTO T329) Initial After 90 min. After 120 min. 8:29 10:02 10:50 Time 507.5 507.5 507.5 Tare Weight Mass (Wt.) H2O 1226.8 1226.0 1225.7 1.1 Sample + Tare Wt. Sample Weight 719.3 718.5 718.2 Percent H<sub>2</sub>O 0.15 Ignition Furnace Data (AASHTO T 308) 3010.7 Ignition Furnace ID: Mass of Empty Basket(s): TIKI Mass of Baskets and Sample: 4578.6 Actual Asphalt Content in %: 5.5 Mass of Sample: 1567.9 Calibration Factor (Ticket) in %: Mix Design Asphalt Content in %: 0.53 5.6 Mass of Residual Agg. & Basket: Percent Loss (Ticket) in %: 6.34 4483.3 Mass of Residual Agg. (Direct): Temperature Compensation (Ticket) in %: 0.19 1472.6 Calibrated Asphalt Content (Ticket) in %: 5.62 Mass of Residual Agg. (Ticket): 1471.5 Difference of Masses of Residual Aggregate - Direct vs. Ticket = -0.1% Specification: shall be within +0.1%. Sieve Analysis (AASHTO T30) 1378 Mass of Dry Washed Residual Aggregate: Sieve Size Accumulative Tolerance **Control Points** Percent Passing **JMF** Upper Upper \*Record all sieves Lower Lower Weight Retained Limit Limit Sieve Slze Limit Limit 1 1/2" 1" 3/4" 0.0 100 100 99 100 100 100 1/2" 72.0 95 94 90 100 90 100 3/8" 78 0 189.7 87 84 90 90 57 567.2 61 #4 39 35 43 28 856.7 42 58 27 29 #16 1046.4 #30 1167.1 21 19 13 15 #50 1251.1 8 1315.4 11 #100 7.0 6.3 #200 1368.9 4.3 7.0 2.0 7.0 1377.7 Pan 0.0% Specification: shall be within ± 0.2% Difference of Masses - Pan vs. Washed = **Bold = Within Tolerance Limits** Black Italic - At Tolerance Limit Red = Outside Tolerance Limit Sample was obtained by King County Representative Tara Pfaff. A companion ssmple was taken by Woodworth. Sample was obtained from truck #91-162, ticket #245361. This truck was the 5th load of the day. The accumulative tonage was 160.01. This is the first of three samples to be taken today. This mix contains 15% RAP and 3% RAS. Ignition Furnace Calibration Factor changed from 0.63 to 0.53. X Material fails to meet above specifications. meets



Form: HMA - 0.45 Gradation Chart

# KC-09-1268

				Plant in	formation				
Sampling Local	tion	Truck	Bed @ Plant	Mix Temp	341				
Collection Date/⊓	Fime	9/25/09	9 @ 6:47 AM	Oil Temp	330	e			
Sample ID		KC	-09-1268	_Air Temp	45	ē			
			G	yratory Data	(AASHTO T	312)			
Initial wt. of Unco	ompact	ed mix.		4800.9	<b>-</b> 6				
Helght in mm of	Sample	@ Initial C	Syrations	127	_ 8		Compaction	Temp. ≃	291
Height in mm of	Sample	@ Design	Gyrations	115.4	_ 100				
			lgr	ition Furnace	(AASHTO	T 308)			<b>特别</b> 等政
Mass of Empty	Baske	t	3010.7	- 1	Percent Lo	ss (Ticket)	in %:	6.34	_
Mass of Basket	& San	nple	4578.6		Temp. Con	np. (Ticket)	in %:	0.19	_ Oil:
Sample Weight	:		1567.9	-0	Ignition Fu	rnace ID:		TIKI	-
Calibration Fac	tor in 9	<b>%</b> :	0.53	<b>-</b> 05	Mass of Re	es. Agg. & l	Bask.	4483.3	_ 5.5
			Moisture Co	ontent (WSD	OT FOP for A	ASHTO T	329)		
Tare Weight	_	507.5		•		Min. test sample 500g.			
Sample + Tare	Wt.	1226.8	Time	8:29	_	163 +/- 14°	C for the ove	en temp.	
Sample + Tare	Wt.	1226.0	After 90 min.	10:02	_				Moist %:
Sample + Tare	Wt.	1225.7	After 120 min.	10:50	_(Use Milita	ry Time, ex	c. 00:00)		0.15
			A PART OF THE PROPERTY OF THE PART OF THE	Rice Data (	ASTM D 204	1)		STEERS TAKE	The car of
						30 mm or	less Hg at 15	min.	
Sample Mass				1642.1	_				
Mass of Pycnor	meter l	Jnder Wa	ter @ 25.0 °C	1277.5	<del></del>		Min. Mass		RICE:
Pycnometer Ca	libratio	on @ 77°F	I			1/2"	1500g		154.9
Mass of Sample	e & Py	cnometer	Under Water	2260.0	_	3/4"	2000g		
Temperature of	f Water	25.0 ± 1.0	0 °C	25.4	5 <b>*</b> ) ====:	1"	2500g	8	
Sieve A	nalysi	(AASH	TO T 30)	10 10 10		В	ulk Specific G	iravity	
Mass of Dry, W	ashed	Sample	1378.0	_					
1 1/2"		#8	856.7	<b>-</b> 1					
1"		#16	1046.4		Weight in			76.5	
3/4"0	0.0	#30	1167.1	<del>-</del>	Weight in			784.3	-
1/2"	2.0	#50	1251.1	_;	Weight SS			788.6	=:
3/8"18	39.7	#100	1315.4	_	Temp 25.0	± 1.0 °C	2	25.0	_
#456	67.2	#200	1368.9	<u></u> :				×	
P	an _	1377.7	_						



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#### **HMA Volumetric Worksheet**

Project: \$	SF 416th St Overlay	Shingles in Pavino	Demo Project Number:	C004555C	:09
Mix ID:	MD090088	Sample ID:	KC-09-1268		1/2"
NAMES OF THE		Rec	quired Data		
Percent Bind	der (Pb)				5.5
% Pass #20	0 Sieve				7.0
Gmm (Rice	Specific Gravity)				2.489
Compaction	Temperature in °F				291
	t of Uncompacted Mixture	e			4800.9
	Syrations @ Initial				8
STATE OF THE PROPERTY OF THE P	Syrations @ Design				100
	Gravity of the Binder)				1.028
	pecific Gravity of the Agg	regate Blend)			2.64
SSEMESTS	Thero	retical Maximum Spec	ific Gravity "Gmm" (ASTM	D 2041)	
(N) Sample	Mass	COUNTY SERVICE STREET, VOLUMENTS, SERVICE, STREET, STR	STATE OF THE STATE		1642.1
	Pycnometer Under Wate	Г			1277.5
	eter Calibration @ 77°F				
	Sample & Pycnometer U	nder Water			2260.0
	ature of Water in °C				25.4
	eter Calibration @ Test T	emperature			
X-2 4	Thermal Correction				
A STOREGO AND A STOREGO	nermal Correction				0.99990
	25°C = N*U/(N-(Q-O))				2.489
	@ 25°C = V*62.245 lb/ft	3			154.9
	ADMINISTRAÇÃO DE CASA PARA		rity "Gmb" (ASTM D2726)		<b>产的数据性的</b>
A = Maes in	Grams of Specimen in Ai			58/8 ( 55 A 2) ( Mo 45 25 ( 4) ( 18) 4 ( 4) ( 18)	4776.5
	Grams of Surface-Dry Sp				4788.6
	Grams of Specimen in W				2784.3
	of the Water °C			<del></del>	25.0
	ature Correction for Dens	ity of Water			1.0000
Gmb =D A /		ity of vvater		(nearest 0.001)	2.383
	= ((B-A) / (B-C))*100			(nearest 0.001)	0.604%
ABSOIPTION		Gyratory Compac	tor Data (AASHTO T 312)		
H @ Nini (He	eight of Sample @ Initial	CONTRACTOR OF THE PARTY OF THE		Control of the American	127
	Height of Sample @ Desi				115.4
	N ini = (Hdes*Gmb)/(Hin			(nearest 0.1)	87.0
	N des = (Gmb)/(Gmm)*1			(nearest 0.1)	95.7
	CASTA NESTRE		SDOT Std. Spec. 9-03.8(7))		
Va = 100 *(1	-(Gmb/Gmm))	Index of his water at a resolution of the plant was a	ce = 2.5% to 5.5%	(nearest 0.1)	4.3
AND PORT OF THE	Volds in	Mineral Aggregate (V	MA) {WSDOT Std. Spec	9-03.8(7))	
VMA = 100 *	(1-(Gmb*Ps/(Gsb*100))	The state of the s	= Min. 14.0%	(nearest 0.1)	14.7
	Volds I	illed With Asphalt (VF	A) (WSDOT Std. Spec. 9	9-03.8(7))	
VFA = 100 *	[(VMA - Va) / VMA]	The second secon	ia = 65 to 75	(nearest 0.1)	70.7
<b>计图记录</b>	Dus	t / Asphalt Ratio (D/A)	(WSDOT Std. Spec. 9-0	3.8(2)}	
Gse = (100 -	Pb) / [(100 /Gmm) - (Pb	/ Gb)]		(nearest 0.001)	2.713
	Gb)*(Gse-Gsb)/(Gse*Gsb			(nearest 0.1)	4.5
P <sub>s</sub> = 100 - Pk				(nearest 0.1)	94.5
	sing #200 Sieve / Pbe	Mix Criteria	a = 0.6 to 1.6	(nearest 0.1)	1.6



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King County
Mix Design Requirements and Specifications

Project: SE 416th St Overlay, S		Demo.	Project Number:	M78			
	worth & Co.		Contract Number:		C004555C09		
	dworth Lakeview		Mix ID: MD0900		HMA Class:1/2 Frank Overton		
Dil Source:	J.S. Oil		Resident Engineer:	Frank	Overt	on	
		Gradation	2				
	Contractor JMF				Control Points		
Sieve Size	% Passing	* <b>LL</b>	folerances *UL	LL.	lass 1/	2" UL	
4.4.608		1	<u> </u>			- OL	
1 1/2" 1"						-	
3/4"	100		100	100	***************************************	100	
1/2"	94	99	100	90	***********	100	
	84	78	90	0		90	
3/8"		52	62		•••••	90	
#4	39		43	28		58	
#8	27	35	43			36	
#16	19						
#30 #50	13		·····				
#30 #100	8					(*)	
#200	6.3	4.3	7.0	2.0		7.0	
			7.0				
Aggregate Source (Pit #)		-160		•			
Binder Grade (PG)	64-22	ESALS	(millions)	3	to	<30	
% Asphalt Content Design	5.6			5.1%	to	6.1%	
% Anti Strip	0.00						
% Water						2% max	
% Va @ Ndes C	3.7			2.5	to	5.5	
% VMA @Ndes C	14.3			14	to	N/A	
% VFA @ Ndes C	74			65	to	75	
Dust/Asphalt Ratio C	1.4			0.6	to	1.6	
Pbe C	4.5	05.0	.16 11			-	
Gmm S	2.463	***********	ecification	O'l- f		45	
Gmb S	2.374	Fractur	e	Single face		90%	
O 1 (A Dissil)	0.040	Cina A	A	Double face		4.40/	
Gsb (Aggregate Blend) S	2.640	Fine A	gregate Angularity			44% min.	
Gsb (Fine Aggregate) S	2.599						
Gb (Binder) S	1.028						
Mixing Temperature in °F	313						
Max. Mixing Temperature in °F	350						
Compaction Temperature in °F	291			Сор	ies Die	stribution	
Number of Gyrations @ Initial	8			•			
Number of Gyrations @ Design	100			2	_	sident Engr.	
Number of Gyrations @ Max.	160			1	_ Cor	nst. Admin.	



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Project: SE 41	6th St Overlay, S	Shingles in	Paving Den	no.Project Number:	M7	78030			
Contractor:	Woody	worth & Co		Contract Number:	C00	4555C09	1		
Asphalt Supplier	r: Wood	worth Lake	eview	Sampling Location:		Bed @ F			
Contractor: Woodworth & Co. Contract Number: C00 Asphalt Supplier: Woodworth Lakeview Sampling Location: Truck Oil Source and Grade: U.S. Oil Collection Date/Time: 9/25/		09 @ 7:5							
Mix ID: M	D090088	Sa	ample ID:	KC-09-1276	HMA Class	s:	1/2"		
	Gradation (AASH	TO T 30)		Volun	netrics (AASHT)				
	~ -					*LL	rolera:		
Sieve Size	% Passing			% Va @ Ndes	2.4	2.5	to	*UL 5.5	
1 1/2"					14.1	12.5	to	N/A	
1"			to		83.0	65	to	75	
3/4"	100	99	to 100	<del></del>	1.4	0.6	to	1.6	
1/2"	95	90	to 100		AASHTO T 209)	2.464	15	3.4 lb/ft <sup>3</sup>	
	84	78	to 90			2.404			
	57		to	Asphalt Content % (K)	CDOT FOP for AASH	HTO T 308)	٠	5.7	
	39	35	to 43				2.0 max		
#16	27		to						
#30	19		to	Mix Temperature in °	'F				
	14		to			330			
	10		to				*		
	7.2	4.3	to 7.0				,		
				*LL=Lower Limit UL	_=Upper Limit				
			Data fro	om Mix Design					
				Oh (Dindon)		4.000			
					: or	1.028	-		
	tent Design			***************************************		313	*		
						291	-		
				***************************************					
					<del></del>	100	- 4-	400	
Gsb (Fine A	ggregate)	2.5	99	ESAL'S (Millions)		3	- <sup>to</sup> -	<30	
Sample was obtained ticket #245387. This to contains 15% RAP and	ruck was the 14th load d 3% RAS. This sampl	of the day. The e has failed to	e accumulative to	nage was 447.56. This is the sec	and of three samples	to be taken	today.	This mix	
								-	
	meet	ts		a a					
Material	<del></del> >		above	specifications.		Copies	Distri	bution	
	X fails	to meet				2	Resid	ent Engr.	
Approved for	<del></del>			Tested and	05/0000		_	. Admin.	
Distribution By:					25/2009	1	Dens.	Engineer	
	Materials Enginee	er	Date	Initial Control	Date	,			
			ii	Mitor 3	000 10/9/	09			



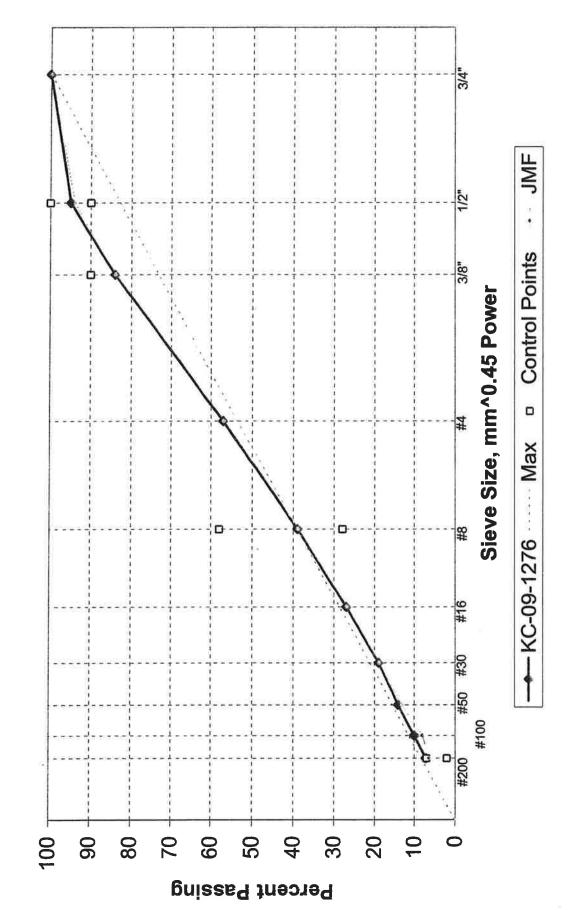
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Fax: (206) 296-0179

### **Ignition Furnace Worksheet**

Project: SE 416	oth St Overlay, Sh	ingles in Paving D	<u><b>Jemo</b></u> Project N	lumber: _	M	78030			
Contractor:	Woodwo	rth & Co.				ımber: <b>C004555C09</b>			
Asphalt Supplier	: Woodwe	orth Lakeview	Sampling	Sampling Location:		Truck Bed @ Plant			
Oil Source and G	Grade:	U.S. Oil	Collection	n Date/Tim	ne: <b>9/25</b>	/09 @ 7:	59 AM		
	0090088	Sample ID:	KC-09-1276	Н	MA Class:	1/2	P9		
		ire Content (WSD	OT FOP for A	ASHTO T	329)		335 F 250		
	Initial	After 90 min	The state of the s	20 min.		COET AND DE	Lexense		
Time	9:12	10:55		:29	1				
Tare Weight	559.4	559.4	55	9.4	1				
Sample + Tare Wt.	1490.2	1487.5	148	B7.4	Mass (Wt.) H <sub>2</sub>	<sub>2</sub> O 2.8			
Sample Weight	930.8	928.1	92	8.0	Percent H <sub>2</sub> O	3	0.30		
MARKATON TO THE PARTY OF THE PA		gnition Furnace D	ata (AASHTO	T 308)			<b>三</b> 数 5%		
Acc of Emphy Bos	And the second s	3057.9	Ignition Fu			T	KI		
Mass of Empty Bas Mass of Baskets an		4787.5							
Mass of Sample:	d Campic.	1729.6	—— Actual A	sphalt Co	ontent in %:	5.7			
Calibration Factor (	Ticket) in %:	0.53	Mix Design	Asphalt Co	ontent in %:	5	.6		
Percent Loss (Ticke		6.69			. & Basket:		73.6		
	ensation (Ticket) in %:			esidual Agg		1615.7			
	Content (Ticket) in %:	5.99		esidual Agg		1616.8			
Difference of Mas	ses of Residual Aggre				on: shall be with	nin <u>+</u> 0.1%.			
		Sieve Analysi		30)					
Mass of Dry Washe	d Residual Aggregate				11211-1120				
Sieve Size	Accumulative			To	olerance	Control Points			
Record all sieves		Percent Passing	JMF	Lower		Lower Uppe			
Sieve Size	Weight Retained			Limit	1 1 1 14	Limit	Limit		
1 1/2"			- 1000-						
1"		- 100 071 - 071		1					
3/4"	0.0	100	100	99	100	100	100		
1/2"	73.1	95	94	90	100	90	100		
3/8"	252.1	84	84	78	90	0	90		
#4	691.3	57	57						
#8	991.6	39	39	35	43	28	58		
#16	1179.6	27	27				SE IS STORY		
#30	1306.1	19	19						
#50	1393.5	14	13						
#100	1453.2	10	8						
#200	1500.0	7.2	6.3	4.3	7.0	2.0	7.0		
Pan	1509.8								
Difference of Masse		= 0.0% Spec	ification: shall be	within ± 0.2	2%				
Sample was obtained be 10069T, ticket #24536 aken today. This mix	within Tolerance L by King County Represent 7. This truck was the 14 contains 15% RAP and 3 cn. Ignition Furnace Calib	tative Tim Hyden. A com th load of the day. The a % RAS. This sample has	s failed to meet spec	taken by Wo was 447.56.	This is the secor	was obtainend of three s	ed from truc amples to b		
	meets	X	fails to m	eet	above s <sub>l</sub>	pecifica	tions.		

1/2 Inch HMA



Form: HMA - 0.45 Gradation Chart

## KC-09-1276

				Plant In	formation	Water State			
Sampling I	Location	Truck	Bed @ Plant	_Mix Temp		•			
Collection D	Date/Time	9/25/09	9 @ 7:59 AM	Oil Temp	330	·			
Sample ID		кс	-09-1276	_Air Temp					
			<b>G</b>	yratory Data	(AASHTO T	312)		Design of the state of the stat	The second secon
Initial wt. of	Uncompac	ted mix.		4802.3	_				
Height in mi	m of Sampl	e @ Initial (	Syrations	126.2	_ 8		Compaction	Temp. =	291
Height in m	m of Sampl	e @ Design	Gyrations	114.1	100				
			lgı	nition Furnace	(AASHTO	T 308)		5. (£. (4.2)	$\vec{r} = 1 \cdot \vec{j} \vec{k} \cdot \vec{r}$
Mass of En	mpty Bask	et	3057.9	_	Percent Lo	oss (Ticket)	in %:	6.69	_
Mass of Ba	asket & Sa	mple	4787.5	_	Temp. Cor	np. (Ticket)	in %:	0.17	_ Oil:
Sample We	eight		1729.6	<b>-</b> 13	Ignition Fu	ırnace ID:		TIKI	-
Calibration	n Factor in	%:	0.53	<b>-</b> 4	Mass of Ro	es. Agg. &	Bask	4673.6	5.7
			Moisture Co	ontent (WSD	OT FOP for A	ASHTO T	329)		10 - 11 10 10 10 10 10 10 10 10 10 10 10 10
Tare Weigh	ht	559.4	_	*		Min. test s	ample 500g.		×
Sample + T	Γare Wt.	1490.2	Time	9:12	<del></del> -	163 +/- 14°	°C for the ove	en temp.	
Sample + T	Γare Wt.	1487.5	_After 90 min.	10:55	_				Moist %:
Sample + T	Γare Wt.	1487.4	_After 120 min.	11:29	_(Use Milita	ıry Time, ex	k. 00:00)		0.30
Sample + 1	Tare Wt.	1487.4	_After 120 min.		_ (Use Milita ASTM D 204	1)	Sea Medical		0.30
Sample + 1	Γare Wt.	1487.4	_After 120 min.			1)	(. 00:00) less Hg at 15	min.	0.30
Sample + T		1487.4	_After 120 min.			1)	Sea Medical	min.	0.30
Sample Ma	ass		_After 120 min.	Rice Data (		1)	Sea Medical	min.	0.30 RICE:
Sample Ma	nss vcnometer	Under Wa	- ter @ 25.0 °C	Rice Data (		1)	less Hg at 15	min.	
Sample Ma Mass of Py Pycnomete	nss /cnometer er-Calibrati	Under Wa	- ter @ 25.0 °C	Rice Data (		1) 30 mm or	less Hg at 15	min.	RICE:
Sample Ma Mass of Py Pycnomete	ass /cnometer er Calibrati ample & Py	Under Waten @ 77°F	ter @ 25.0 °C	1620.6 1277.5		1) 30 mm or	Min. Mass	min.	RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperature	ass /cnometer er Calibrati ample & Py	Under Water Water @ 77°F	ter @ 25.0 °C : Under Water	1620.6 1277.5		1) 30 mm or 1/2" 3/4" 1"	Min. Mass 1500g 2000g		RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperature	ass vcnometer er Calibrati ample & Py are of Wate	Under Water Water was a second to the contract of the contract	ter @ 25.0 °C : Under Water	1620.6 1277.5	ASTM D 204	1) 30 mm or 1/2" 3/4" 1"	Min. Mass 1500g 2000g 2500g		RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur	ass vcnometer er Calibrati ample & Py are of Wate	Under Water Water was a second to the contract of the contract	ter @ 25.0 °C Under Water ) °C	1620.6 1277.5	ASTM D 204	1) 30 mm or 1/2" 3/4" 1"	Min. Mass 1500g 2000g 2500g		RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur	ass vcnometer er Calibrati ample & Py are of Wate	Under Water Water was a second to the contract of the contract	ter @ 25.0 °C Under Water ) °C	1620.6 1277.5	ASTM D 204	1) 30 mm or 1/2" 3/4" 1"	Min. Mass 1500g 2000g 2500g		RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur Sie Mass of Dry	ass vcnometer er Calibrati ample & Py are of Wate	Under Water @ 77°F renometer r 25.0 ± 1.0 is (AASH1	ter @ 25.0 °C Under Water ) °C  O T 30)  1510.0	1620.6 1277.5	ASTM D 204	1) 30 mm or 1/2" 3/4" 1" Bu	Min. Mass 1500g 2000g 2500g ulk Specific G	<b>ravity</b> 83.8	RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur Sie Mass of Dry	ass vcnometer er Calibrati ample & Py are of Wate	Under Waten @ 77°F renometer r 25.0 ± 1.0 is (AASH1 I Sample	ter @ 25.0 °C  Under Water  O °C  1510.0  991.6	1620.6 1277.5	Weight in	1) 30 mm or  1/2" 3/4" 1"  Buth the second of the second o	Min. Mass 1500g 2000g 2500g ulk Specific G	<b>83.8</b> 98.9	RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur Sie Mass of Dry 1 1/2" 1"	ass yenometer er Calibrati ample & Py are of Wate eve Analysi y, Washed	Under Water (1997) Under Water (	ter @ 25.0 °C  Under Water  O °C  1510.0  991.6  1179.6	1620.6 1277.5	Weight in Weight SS	1) 30 mm or 1/2" 3/4" 1" Bu	Min. Mass 1500g 2000g 2500g ulk Specific G	83.8 98.9 88.5	RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur Sie Mass of Dry  1 1/2"  1"  3/4"	ass yenometer er Calibrati ample & Py are of Wate eve Analysi y, Washed	Under Water was on @ 77°F recometer r 25.0 ± 1.0 is (AASH1 Sample #8 #16 #30	ter @ 25.0 °C  Under Water 0 °C  1510.0  991.6  1179.6  1306.1	1620.6 1277.5	Weight in	1) 30 mm or 1/2" 3/4" 1" Bu	Min. Mass 1500g 2000g 2500g ulk Specific G	<b>83.8</b> 98.9	RICE:
Sample Ma Mass of Py Pycnomete Mass of Sa Temperatur  Sie Mass of Dry  1 1/2"  1"  3/4"  1/2"	once of Water Analysis, Washed	Under Wallon @ 77°F conometer r 25.0 ± 1.0 s (AASH1 Sample #8 #16 #30 #50	ter @ 25.0 °C  Under Water  O °C  O T 30)  1510.0  991.6  1179.6  1306.1  1393.5	1620.6 1277.5	Weight in Weight SS	1) 30 mm or 1/2" 3/4" 1" Bu	Min. Mass 1500g 2000g 2500g ulk Specific G	83.8 98.9 88.5	RICE:



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SE 416th St Overlay Ship	ngles in Paving Demo-Project Number:

Project:	SF 416th St Overlay	Shingles in Pavino	Demo Project Number	r: C004555	C09
Mix ID:	MD090088	Sample ID:	KC-09-1276	HMA Class:	1/2"
		Rec	juired Data		
Percent B	inder (Pb)				5.7
% Pass #2	200 Sieve				7.2
Gmm (Ric	e Specific Gravity)				2.464
Compaction	on Temperature in °F				291
Initial Weig	ht of Uncompacted Mixture	е			4802.3
Number o	Gyrations @ Initial				8
Number of	Gyrations @ Design				100
Gb (Speci	fic Gravity of the Binder)				1.028
Gsb (Bulk	Specific Gravity of the Agg	regate Blend)			2.64
	Thero	retical Maximum Spec	ific Gravity "Gmm" (ASTI	M D 2041)	<b>表的杂形</b> 。
(N) Sampl	e Mass	AND A DATE OF THE PARTY OF THE			1620.6
(O) Mass	of Pycnometer Under Wate	r			1277.5
	neter Calibration @ 77°F				
(Q) Mass	of Sample & Pycnometer U	nder Water			2240.3
(R) Tempe	erature of Water in °C				24.9
(S) Pycnor	neter Calibration @ Test T	emperature			
(T) Bitume	n Thermal Correction				
(U) Water	Thermal Correction				1.00003
(V) Gmm	@ 25°C = N*U/(N-(Q-O))				2.464
(W) Densi	ty @ 25°C = V*62.245 lb/ft	13			153.4
		Bulk Specific Grav	rity "Gmb" (ASTM D2726)		
A = Mass i	n Grams of Specimen in Ai	district the second		The same of the sa	4783.8
	n Grams of Surface-Dry Sp				4788.5
Z	n Grams of Specimen in W				2798.9
THE STATE OF THE S	re of the Water °C	<del></del>			25.0
	erature Correction for Dens	sity of Water			1.0000
Gmb =D A				(nearest 0.001)	
	n = ((B-A) / (B-C))*100			(nearest 0.001)	0.236%
		Gyratory Compac	tor Data (AASHTO T 312)		K g
H @ Nini (	Height of Sample @ Initial	Gyrations)			126.2
	(Height of Sample @ Desi				114.1
	N ini = (Hdes*Gmb)/(Hin			(nearest 0.1)	
	N des = (Gmb)/(Gmm)*1			(nearest 0.1)	97.6
		Air Voids (Va) {W:	SDOT Std. Spec. 9-03.8(7	ne e recentation	
Va = 100 *	(1-(Gmb/Gmm))	PROPERTY AND ADDRESS OF THE PARTY OF THE PAR	ce = 2.5% to 5.5%	(nearest 0.1)	2.4
en viikaliika	Voids in	Mineral Aggregate (V	MA) {WSDOT Std. Spec	:. 9-03.8(7))	
VMA = 100	) *(1-(Gmb*Ps/(Gsb*100))	CONTRACTOR OF THE PROPERTY OF	= Min. 14.0%	(nearest 0.1)	14.1
<b>医</b> 克勒尼尔氏反射			A) (WSDOT Std. Spec.	9-03 8/7))	Self Straws
/FΔ = 100	* [(VMA - Va) / VMA]	THE OF PROPERTY AND ADMINISTRATION OF THE PARTY AND ADMINISTRATION.	ia = 65 to 75	(nearest 0.1)	83.0
SANS FERBARIA			(WSDOT Std. Spec. 9-		(A) 京东南部(1020)
Geo - /10/	) - Pb) / [(100 /Gmm) - (Pb	22 Part process of your and Spring and Commission of the Commissio	(11000) old. opec. 3	(nearest 0.001)	2.691
	*Gb)*(Gse-Gsb)/(Gse*Gsb			(nearest 0.1)	
- ne(Fs		7		(nearest 0.1)	
P <sub>s</sub> = 100 -	Ph			(nearest u 1)	94.3



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King County
Mix Design Requirements and Specifications

roject: SE 416th St Overlandschaper V	ay, Shingles in Pa loodworth & Co.		Project Number: Contract Number:	M780 C0045	
	Woodworth Lake	view N	Mix ID: MD090088	HMA CI	ass: 1/2"
il Source:	U.S. Oil	F	Resident Engineer:	Frank (	Overton
		Gradation	<del></del>		
	Contractor JN			Cont	rol Points
Sieve Size	% Passing		lerances		nss 1/2"
		*LL	*UL	LL	UL
1 1/2"					
1"					
3/4"	100	99	100	100	100
1/2"	94	90	100	90	100
3/8"	84	78	90	0	90
#4	57	52	62		
#8	39	35	43	28	58
#16	27				
#30	19				
#50	13				
#100	8				
#200	6.3	4.3	7.0	2.0	7.0
Aggregate Source (Pit #)	B-333	B-160			
Binder Grade (PG)	64-22	ESAL'S (	(millions)	3	to <30
% Asphalt Content Design	5.6			5.1%	to 6.1%
% Anti Strip	0.00		and the second s		
% Water					2% max
% Va @ Ndes C	3.7	K-105-8-81-01-Ca		2.5	to 5.5
% VMA @Ndes C	14.3	otanna a possa		14	to N/A
% VFA @ Ndes C	74			65	to75
Dust/Asphalt Ratio C	1.4		- AND	0.6	to <u>1.6</u>
Pbe C	4.5				
Gmm S	2.463	SE Spec	ification		45
Gmb S	2.374	Fracture	Si	ingle face	90%
***************************************		34444	D	ouble face	
Gsb (Aggregate Blend)	S 2.640	Fine Agg	regate Angularity		44% min
Gsb (Fine Aggregate)	<b>S</b> 2.599	-			
Gb (Binder)	<b>S</b> 1.028				
Mixing Temperature in °F	313				
Max. Mixing Temperature in	°F 350				
Compaction Temperature in					
Number of Gyrations @ Initi	2.7.7			Copie	s Distribution
Number of Gyrations @ Des				2	Resident Engr.
Number of Gyrations @ Max				1	Const. Admin.



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Project: SE 416	th St Overlay, S	hingles in Pa	ving Dem	o. Project Number:	M7	8030	
Contractor:	Woody	vorth & Co.		Contract Number:	C00	4555C09	)
Asphalt Supplier:	Wood	worth Lakev	iew	Sampling Location:	Truck	Bed @ F	Plant
Oil Source and G	rade:	U.S. Oil		Collection Date/Time:	9/25/0	9 @ 11:1	17 AM
Mix ID: MD	090088	Sam	ple ID:	KC-09-1278	HMA Class	3:	1/2"
G	radation (AASH	TO T 30)		Volun	etrics (AASHT)	O T 312)	
				•			olerances
Sieve Size	% Passing	Tolerar		0/ \/a ⊜ Ndaa	0.7	*LL	*UL
1 1/2"		*LL to	*UL	% Va @ Ndes	14.2	2.5	to 5.5
1"		to		% VMA @Ndes		12.5	to <u>N/A</u>
3/4"	100		100	% VFA @ Ndes	81.0	65	to
				Dust/Asphalt Ratio		0.6	to 1.6
1/2"	92	90 to	100	Gmm (WSDOT FOP for		2.472	153.9 lb/ft <sup>3</sup>
3/8"	83	78 to	90	Gmb (ASTM D		2.405	-
#4	57	to		Asphalt Content % (KG	~~~~~		5.8
#8	38	35 to	43	% Water (WSDOT FOP)	for AASHTO T 329)	0.19	2.0 max
#16	26	to					
#30	19	to		Mix Temperature in °	F	329	
#50	13	to		Oil Temperature in °f		330	-:
#100	10	to		Air Temperature in °l	=	57	T:
#200	6.8	4.3 to	7.0	(10) I Company and a company a			-
				*LL=Lower Limit UL	.=Upper Limit		
			Data fro	m Mix Design			
				01 (01 1 )			
Aggregate So			0	Gb (Binder)	:_ oF	1.028	-
Asphalt Conte	ent Design	5.6%		Mixing Temperature		313	-
Anti Strip		0.00%	_	Compaction Temper		291	_
Pbe		4.5		Number of Gyrations		88	-
	ite Blend)			Number of Gyrations	@ Design	100	-
Gsb (Fine Ag	gregate)	2.599		ESAL'S (millions)		3	to <30
Remarks:							
Sample was obtained by	King County Repres	entative Tim Hyde	n. A companio	on sample was taken by Woodwo	rth. Sample was obt	ained from t	ruck #82-182,
contains 15% RAP and				nage was 610.88. This is the third from 0.63 to 0.53.	or three samples to	be taken to	day. I his mix
	X meet	s					
Material			above s	pecifications.		Copies	Distribution
CG.	fails	to meet				2	Resident Engr.
Approved for				Tested and		1	Const. Admin.
Distribution By:				Submitted by: TEP 9/	25/2009	1	Dens. Engineer
	Materials Enginee	erio.	Date	Initial	Date	-	
				Wester 1	Now.		
					18/9/25		
Form: HMA - Tes	st Results				1110	Rev	vised: 4/22/08

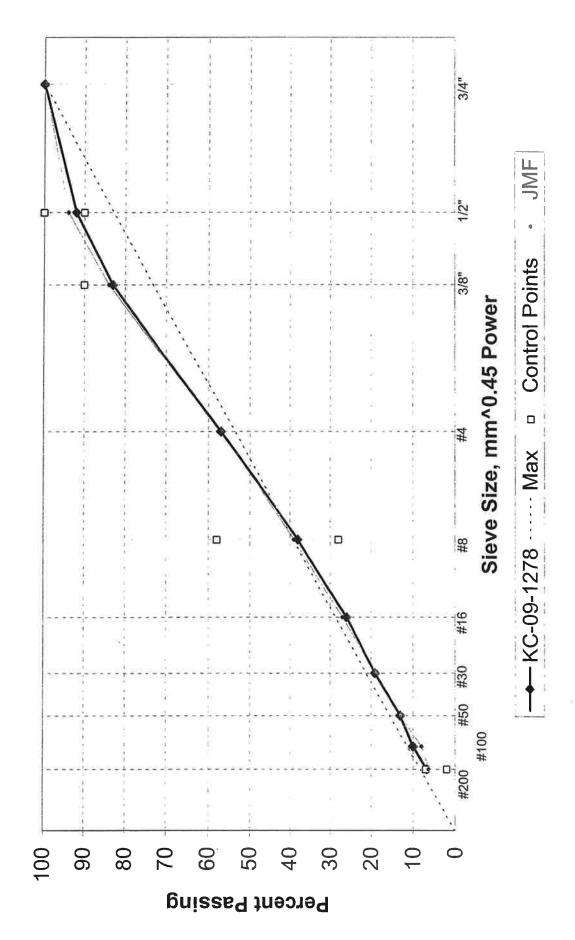


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**Ignition Furnace Worksheet** Project: SE 416th St Overlay, Shingles in Paving DemoProject Number: M78030 C004555C09 Woodworth & Co. Contract Number: Contractor: Sampling Location: Truck Bed @ Plant Woodworth Lakeview Asphalt Supplier: Collection Date/Time: 9/25/09 @ 11:17 AM U.S. Oil Oil Source and Grade: 1/2" KC-09-1278 **HMA Class:** MD090088 Sample ID: Mix ID: **Moisture Content (WSDOT FOP for AASHTO T329)** After 90 min. After 120 min. Initial 2:48 12:39 2:05 Time 508.0 508.0 508.0 Tare Weight 1231.7 Mass (Wt.) H2O 1233.1 1231.7 1.4 Sample + Tare Wt. 723.7 725.1 723.7 Percent H<sub>2</sub>O 0.19 Sample Weight Ignition Furnace Data (AASHTO T 308) TIKI Ignition Furnace ID: Mass of Empty Basket(s): 3011.1 Mass of Baskets and Sample: 4868.2 Actual Asphalt Content in %: 5.8 Mass of Sample: 1857.1 Mix Design Asphalt Content in %: 5.6 Calibration Factor (Ticket) in %: 0.53 Mass of Residual Agg. & Basket: 4745.3 Percent Loss (Ticket) in %: 6.65 0.16 Mass of Residual Agg. (Direct): 1734.2 Temperature Compensation (Ticket) in %: Mass of Residual Agg. (Ticket): 1736.6 5.96 Calibrated Asphalt Content (Ticket) in %: 0.1% Specification: shall be within ±0.1%. Difference of Masses of Residual Aggregate - Direct vs. Ticket = Sieve Analysis (AASHTO T30) 1624.5 Mass of Dry Washed Residual Aggregate: Control Points Tolerance Sieve Size Accumulative Percent Passing **JMF** Upper Upper Lower Lower \*Record all sieves Weight Retained Limit Limit Limit Limit Sieve Size 1 1/2" 1" 99 100 100 100 3/4" 0.0 100 100 90 100 90 100 147.3 92 94 1/2" 78 90 0 90 296.0 83 84 3/8" 741.7 57 57 #4 28 39 35 43 58 1074.2 38 #8 1278.0 27 26 #16 19 1411.1 19 #30 13 13 1504.2 #50 1568.4 10 8 #100 7.0 2.0 7.0 6.8 6.3 4.3 1616.6 #200 1624.5 Pan Difference of Masses - Pan vs. Washed = Specification: shall be within ± 0.2% 0.0% Red = Outside Tolerance Limit Black Italic - At Tolerance Limit **Bold = Within Tolerance Limits** Remarks: Sample was obtained by King County Representative Tim Hyden. A companion sample was taken by Woodworth. Sample was obtained from truck #82-182, ticket #245461. This truck was the 19th load of the day. The accumulative tonage was 610.88. This is the third of three samples to be taken today. This mix contains 15% RAP and 3% RAS. Ignition Furnace Calibration Factor changed from 0.63 to 0.53.

Material	X	meets	fails to meet	above specifications.
----------	---	-------	---------------	-----------------------



Form: HMA - 0.45 Gradation Chart

## KC-09-1278

			Plant In	formation				
Sampling Location	Truck	Bed @ Plant	Mix Temp	329			24"	
Collection Date/Time	9/25/09	@ 11:17 AM	Oil Temp	330				
Sample ID	кс	-09-1278	Air Temp	57				
		G	yratory Data	(AASHTO T	312)			
Initial wt. of Uncomp	acted mix.		4807.9					
Height in mm of Sam	ple @ Initial C	Syrations	127.4	_ 8		Compaction	Temp. =	291
Height in mm of Sam	ple @ Design	Gyrations	114.9	_ 100				
		lgr	ition Furnace	(AASHTO T	308)			
Mass of Empty Bas	sket	3011.1	-	Percent Lo	ss (Ticket)	in %:	6.65	_
Mass of Basket & S	Sample	4868.2	-	Temp. Com	np. (Ticket)	) in %:	0.16	_ Oil:
Sample Weight		1857.1	-	Ignition Fu	rnace ID:		TIKI	_
Calibration Factor	in %:	0.53	-:	Mass of Re	es. Agg. &	Bask.	4745.3	5.8
		Moisture Co	ontent (WSD	OT FOP for A	ASHTO T	329)		
Tare Weight	508.0	_	Ĭ		Min. test s	ample 500g.		
Sample + Tare Wt.	1233.1	_Time	12:39	<u></u> :	163 +/- 14°	°C for the ov	en temp.	
Sample + Tare Wt.	1231.7	_After 90 min.	2:05	_				Moist %:
Sample + Tare Wt.	1231.7	_After 120 min.	2:48	_(Use Milita	ry Time, ex	c. 00:00)		0.19
			Rice Data (	ASTM D 2041				
					30 mm or	less Hg at 15	min.	
Sample Mass			1557.0	_			1	
Mass of Pycnomet	er Under Wa	ter @ 25.0 °C	1277.5	_		Min, Mass		RICE:
Pycnometer Calibr	ation @ 77°F	•	-	_	1/2"	1500g		153.9
Mass of Sample &	Pycnometer	Under Water	2204.7	_	3/4"	2000g		
Temperature of Wa	iter 25.0 ± 1.0	0°C	25.2	_	1"	2500g	<u> </u>	
Sieve Anal	ysis (AASH1	TO T 30)			В	ulk Specific (	Gravity	
Mass of Dry, Wash	ed Sample	1624.5	-					
1 1/2"	#8	1074.2	<del></del>		A *-			
1"	#16	1278.0	_	Weight in			789.8	_
3/4" 0.0	#30	1411.1	<del></del> :	Weight in			804.0	_
1/2" 147.3	<b>#50</b>	1504.2		Weight SS		4	795.3	_
3/8" 296.0	#100	1568.4	=	Temp 25.0	± 1.0 °C		24.9	<del>-</del>
#4 741.7	#200	1616.6	_					
Pan	1624.5	_						

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#### **HMA Volumetric Worksheet** SE 416th St Overlay, Shingles in Paying Demo Project Number:

Project:	SE 416th St Overlay,	Shingles in Paving	DemoProject Number:	C004555C	:09
Mix ID:_	MD090088	Sample ID:	KC-09-1278	HMA Class:	1/2"
		Req	uired Data		
Percent Bi	nder (Pb)				5.8
% Pass #2	200 Sieve				6.8
Gmm (Ric	e Specific Gravity)				2.472
Compaction	n Temperature in °F				291
Initial Weig	tht of Uncompacted Mixture				4807.9
Number of	Gyrations @ Initial				8
Number of	Gyrations @ Design				100
Gb (Specif	ic Gravity of the Binder)				1.028
Gsb (Bulk	Specific Gravity of the Aggre	egate Blend)			2.64
	Theror	etical Maximum Spec	ific Gravity "Gmm" (ASTM	D 2041)	
(N) Sample	e Mass				1557
(O) Mass o	of Pycnometer Under Water				1277.5
(P) Pycnor	neter Calibration @ 77°F				
(Q) Mass o	of Sample & Pycnometer Un	der Water			2204.7
(R) Tempe	rature of Water in °C	PARTY WATER WATER TO THE PROPERTY OF THE SAME OF THE S			25.2
(S) Pycnor	neter Calibration @ Test Te	mperature			
(T) Bitume	n Thermal Correction				
(U) Water	Thermal Correction				0.99995
(V) Gmm (	25°C = N*U/(N-(Q-O))				2.472
(W) Densi	ty @ 25°C = V*62.245 lb/ft				153.9
	.T.	Bulk Specific Grav	ity "Gmb" (ASTM D2726)		
A = Mass i	n Grams of Specimen in Air		,		4789.8
	n Grams of Surface-Dry Spe				4795.3
	n Grams of Specimen in Wa				2804.0
	re of the Water °C				24.9
	erature Correction for Densit	v of Water			1.0000
Gmb =D A				(nearest 0.001)	2.405
	n = ((B-A) / (B-C))*100			(nearest 0.001)	0.276%
	, <del>****</del>	Gyratory Compact	or Data (AASHTO T 312)		
H @ Nini (I	Height of Sample @ Initial G				127.4
	(Height of Sample @ Desig				114.9
	N ini = (Hdes*Gmb)/(Hini*			(nearest 0.1)	87.7
Contract of the Contract of th	N des = (Gmb)/(Gmm)*10				
% Gmm @	N des – (Gillb)/(Gillill) 10	0		(nearest 0.1)	97.3
% Gmm @	N des – (Ginb)/(Gillii) 10		SDOT Std. Spec. 9-03.8(7)}	(nearest 0.1)	97.3
	(1-(Gmb/Gmm))	Air Voids (Va) {WS	SDOT Std. Spec. 9-03.8(7)} e = 2.5% to 5.5%	(nearest 0.1) (nearest 0.1)	97.3
	(1-(Gmb/Gmm))	Air Voids (Va) {WS	e = 2.5% to 5.5%	(nearest 0.1)	
Va = 100 *(	(1-(Gmb/Gmm)) Voids in I	Air Voids (Va) {WS  JMF Tolerand  Mineral Aggregate (Vi	e = 2.5% to 5.5% MA) {WSDOT Std. Spec.	(nearest 0.1) 9-03.8(7)}	2.7
Va = 100 *(	(1-(Gmb/Gmm)) Voids in I 0 *(1-(Gmb*Ps/(Gsb*100)))	Air Voids (Va) {WS JMF Tolerand Mineral Aggregate (VI Mix Criteria	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec. = Min. 14.0%	(nearest 0.1) 9-03.8(7)) (nearest 0.1)	
Va = 100 *( VMA = 100	(1-(Gmb/Gmm))  Voids in I  *(1-(Gmb*Ps/(Gsb*100)))  Voids Fi	Air Voids (Va) {WS  JMF Toleranc  Mineral Aggregate (VI  Mix Criteria  illed With Asphalt (VF	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec. = Min. 14.0%  A) {WSDOT Std. Spec. 9	(nearest 0.1) 9-03.8(7)) (nearest 0.1)	2.7
Va = 100 *( VMA = 100	(1-(Gmb/Gmm))  Voids in I  *(1-(Gmb*Ps/(Gsb*100)))  Voids Fi  * [(VMA - Va) / VMA]	Air Voids (Va) {WS  JMF Tolerand  Mineral Aggregate (Vi)  Mix Criteria  Illed With Asphalt (VF)  Mix Criteria	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec.  = Min. 14.0%  A) {WSDOT Std. Spec. 9  a = 65 to 75	(nearest 0.1) 9-03.8(7)) (nearest 0.1) 0-03.8(7)) (nearest 0.1)	2.7
Va = 100 *( VMA = 100 VFA = 100	(1-(Gmb/Gmm))  Voids in I  (1-(Gmb*Ps/(Gsb*100)))  Voids Fi  * [(VMA - Va) / VMA]  Dust	Air Voids (Va) {WS  JMF Toleranc  Mineral Aggregate (Vi  Mix Criteria  illed With Asphalt (VF  Mix Criteria  / Asphalt Ratio (D/A)	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec. = Min. 14.0%  A) {WSDOT Std. Spec. 9	(nearest 0.1) 9-03.8(7)} (nearest 0.1) 1-03.8(7)} (nearest 0.1)	2.7 14.2 81.0
VA = 100 *( VMA = 100 VFA = 100 Gse = (100	(1-(Gmb/Gmm))  Voids in I  *(1-(Gmb*Ps/(Gsb*100)))  Voids Fi  * [(VMA - Va) / VMA]  Dust  - Pb) / [(100 /Gmm) - (Pb /	Air Voids (Va) {WS  JMF Toleranc  Mineral Aggregate (VI  Mix Criteria  illed With Asphalt (VF  Mix Criteria  / Asphalt Ratio (D/A)  Gb)]	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec.  = Min. 14.0%  A) {WSDOT Std. Spec. 9  a = 65 to 75	(nearest 0.1) 9-03.8(7)} (nearest 0.1) 0-03.8(7)} (nearest 0.1) 3.8(2)} (nearest 0.001)	2.7 14.2 81.0 2.706
VA = 100 *(  VMA = 100  VFA = 100  Gse = (100	Voids in I  Voids in I  (1-(Gmb*Ps/(Gsb*100)))  Voids Fi  * [(VMA - Va) / VMA]  Dust  1 - Pb) / [(100 /Gmm) - (Pb / (Gsb)*(Gse*Gsb)-	Air Voids (Va) {WS  JMF Toleranc  Mineral Aggregate (VI  Mix Criteria  illed With Asphalt (VF  Mix Criteria  / Asphalt Ratio (D/A)  Gb)]	e = 2.5% to 5.5%  MA) {WSDOT Std. Spec.  = Min. 14.0%  A) {WSDOT Std. Spec. 9  a = 65 to 75	(nearest 0.1) 9-03.8(7)} (nearest 0.1) 1-03.8(7)} (nearest 0.1)	2.7 14.2 81.0



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**Mix Design Requirements and Specifications** 

Project: SE 416th St O	veriay, S	hingles in Paving	Demo.	Project Number:		M78030	
Contractor:	Wood	worth & Co.		Contract Numbe	r: <b>C</b> (	004555C	09
Asphalt Supplier:	Woo	dworth Lakeview		Mix ID: MD09	MH 8800	1A Class:	1/2"
Oil Source:	l	J.S. Oil		Resident Enginee	er: Fr	ank Ove	rton
			Gradatio	7			
		Contractor JMF				Control I	oints
Sieve Size		% Passing		Tolerances	15/6	Class	
			*LL	*UL	LL		UL
1 1/2"							
1"							
3/4"		100	99	100	100		100
1/2"		94	90	100	90		100
3/8"		84	78	90	0		90
#4		57	52	62	<b></b>		
#8		39	35	43	28		58
#16		27					
#30		19					
#50		13			ļ		
#100		8			ļ		
#200		6.3	4.3	7.0	2.0		7.0
Aggregate Source (Pit #	<b>‡</b> )	B-333 B	3-160				
Binder Grade (PG)		64-22	ESAI	_'S (millions)	3	to	<30
% Asphalt Content Desi	ign	5.6			5.19	<u>6</u> to	6.1%
% Anti Strip		0.00					
% Water							2% max
% Va @ Ndes	С	3.7			2.5	to	5.5
% VMA @Ndes	С	14.3			14	to	N/A
% VFA @ Ndes	С	74			65	to	75
Dust/Asphalt Ratio	С	1.4			0.6	to	1.6
Pbe	С	4.5					
Gmm	S	2.463	SE S	pecification			45
Gmb	S	2.374	Fract	ure	Single face		90%
					Double face		
Gsb (Aggregate Blend)	S	2.640	Fine	Aggregate Angularit	у		44% min
Gsb (Fine Aggregate)	S	2.599					
Gb (Binder)	S	1.028					
Mixing Temperature in '	°F	313					
Max. Mixing Temperatu	re in °F	350					
Compaction Temperatu	re in °F	291					
Number of Gyrations @	Initial	8				Copies	Distribution
Number of Gyrations @	Design	100				2	Resident Engr.
Number of Gyrations @	Max.	160				1 (	Const. Admin.



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		nma milieral A	gyreyate nesuits			
Project:	SE 416th St Overl	ay	Project Number:	n <u>i</u>	M78030	
Contractor:	Woodworth		Contract Number	r:	C00455C09	
Name of Source: M	iles Sand and Gra	avel Roy Pit	_Sampling Location	on:	Plant/Belt	
Lab Sample Number:	KC-09-	1269	_Collection Date:	9	/25/2009 @ Aft	ernoon
Mix ID: MD090088	Pit #: I	<b>B-333</b> S	ampled By:	TEP HM	IA Class:	1/2"
	Sand	d Equivalent 1	est (AASHTO	T-176)		
SE Value=	Sand Reading (10	0)	Clay Reading	Sand Readin	ng SE Value	
_	Clay Reading		5.5	3.3	60	
	, ,		Specification =	45 Min		
	Percentage of F	racture in Cou	uree Aggregate	T OTHERAN	P_61)	
	ercentage of F	racture in Col	urse Aggregate	(AASIIIO I	F-01)	
P = Percent of frac	ture	Q = Mas	s of questionable <sub>l</sub>	particles or bor	derline particles	1
F = Mass of fractu	red particles	N = Mass	of unfractured pa	articles		
	Sieve Size	F	Q	N	Р	
$\left[\left(F_{+}(Q/)\right)\right]$	1"		,			
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right  *100$	3/4"					
F+Q+N	1/2"	82.7	0.0	7.0	92	
L	3/8"	126.3	0.0	7.1	95	
	#4	32.1	0.0	1.2	96	
Specificati	on = Single	Face = 90 %	Double Fac	ce =		
U	ncompacted Vo	id Content of	Fine Aggregat	e (AASHTO	T-304)	
V = Volume of cyli	ndrical measure, m	nl	G = Bulk	dry specific gr	avity fine agg. (	G₃₀)
F = Net mass, g, o	f fine aggregate in	measure	U = Unco	ompacted voids	s, percent, in the	e material
Preparation of T			1		$\lceil \nu = \langle F/ \rangle \rceil$	
Sieve Size	Mass	Tare	185.	64 <i>U</i>	$= \left[ \frac{V - (F/G)}{V} \right] *10$	0
#8 - #16	44 +/- 0.2 g		The superficient control of th		L J	•
#16 - #30	57 +/- 0.2 g	V	F	G	U	
#30 - #50	72 +/- 0.2 g	100.0	137.11	2.599	47.2	
#50 - #100	17 +/- 0.2 g	100.0	137.13	2.599	47.2	
Specification	44 Min.			Average	47	
Remarks:						
X	meets					
Material			pecifications.		Copies	Distribution
·	fails to meet				2	Resident Engr.
Approved for		T	ested and		1	Const. Admin.
Distribution By:		s	ubmitted by: LKW	9/28/2009	-	
Ma	terials Engineer	Date	Initial	Date	-	·



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			ggregate Results			
Project: S	E 416th St Overla	ay	Project Number:		M78030	
Contractor:	Woodworth		Contract Numbe	r:	C00455C09	
Name of Source: Mi	les Sand and Gra	vel Roy Pit	Sampling Location		Plant/Belt	
Lab Sample Number: _	KC-09-	1279	Collection Date:	9	/25/2009 @ Aft	ernoon
Mix ID: MD090088	Pit #: <b>E</b>	3 <b>-333</b> Sa	ampled By:	TEP HM	IA Class:	1/2"
	Sand	Equivalent T	est (AASHTO	T-176)		
SE Value= \$	Sand Reading (100	0)	Clay Reading	Sand Readir	ng SE Value	
02 (4,140	Clay Reading	<u>- /                                    </u>	5.9	3.2	55	
	,	1.0	Specification =	45 Min		<del></del> -
В	ercentage of Fr	acture in Cou	rse Aggregate	(AASHTO T	P-61)	
F	ercentage of th					
P = Percent of fract			of questionable		derline particles	
F = Mass of fracture	ed particles	N = Mass	of unfractured pa	articles		Î
	Sieve Size	F	Q	N	Р	
$\left[\left(F+\left(\frac{Q}{2}\right)\right)\right]$	1"					
$P = \left  \frac{\left( F + \left( \frac{Q}{2} \right) \right)}{F + Q + N} \right  *100$	3/4"					
F+Q+N		406.5	0.0	7.7	98	
ال ا	3/8"	667.5	0.0	5.0	99	
	#4	137.6	0.0	0.6	100	Į.
Specification		Face = 90 %	Double Fa			
Ur	ncompacted Vo	id Content of	Fine Aggregat	te (AASHTO	T-304)	
V = Volume of cylin	drical measure, m	ıl	G = Bulk	dry specific gr	avity fine agg. (	$G_{b})$
F = Net mass, g, of			U = Unc	ompacted void	s, percent, in the	e material
Preparation of Te			M		$\lceil \nu(F/) \rceil$	
Sieve Size	Mass	Tare	185.	.64	$= \left[ \frac{V - \left( \frac{F}{G} \right)}{V} \right] * 10$	0
#8 - #16	44 +/- 0.2 g				L ' J	e e
#16 - #30	57 +/- 0.2 g	V	F	G	U	
#30 - #50	72 +/- 0.2 g	100.0	138.01	2.599	46.9	
#50 - #100	17 +/- 0.2 g	100.0	137.56	2.599	47.1	-
Specification	44 Min.			Average	47	]
Remarks:						
					2818	
<u>X</u>	meets		101 41		Camina	Distribution
Material		above sp	ecifications.		Copies	Distribution
	fails to meet				2	Resident Engr.
Approved for			ested and		1	Const. Admin.
Distribution By:			ubmitted by: <u>CW</u>		(4	
Mat	erials Engineer	Date	Initial	I Date	S <del>ection</del>	

Department of Transportation Mbaterials Laboratory King County

King County Hot Mix Asphalt Compaction Form

155 Monroe Avenue NE, Bldg. D, Renton, WA 98056-4199 Phone: (206) 296-7709 Fax: (206) 296-0179

Date	9/25/09	09 Project		416th R.	416th RAS Study	^	No.		Section	ion		Prime	Woodworth	h Paving Co.	o. Woodworth	th Plant	Lakeview
Class	1/2" [	Тіш	Start A	Start Air Temp.	50 End	End Air Temp.	62	Gauge		Troxler 4640B #2659	0B #2659		Mix I.D.	¥	MD090088	ğ	#
timate	Estimated Density (p) =		0.0759 Tons/ft3	Width (W) =	= 13ft	t   Depth (D) =		0.17ft Sub	Subiot Size (S)	200 Tons			2635.0 ft3		Lot Length to nearest $10^{\circ}$ (A) = $V(R^3) / W(R) \times D(R) =$	100°(A)	1190ft
Beg. Sta.		+	Sublot L	Sublot Ln. $[(A) \times 0.2] = (L)$	(7) = (	238ft	Sta. to Sta.	o Sta.			700.	Enumclaw		ACP Test Temp.	.d	# J07	16
Test	Location Code	Sode		Test	Test Location	_		Offset	Depth		Gauge Readings	SÕ	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
	Section #2	#5		, es	37+40			3. LT	0.17	141.7	142.6		142.2	0.999	142.0	154.9	91.7
	Section #2	#2		e	39+60			5.5' LT	0.17	147.5	148.0		147.8	0.999	147.6	154.9	95.3
	Section #2	#2		4	41+35			9°LT	0.17	144.2	144.7		144.5	0.999	144.3	154.9	93.2
	Section #2	#2		4	43+15			6.5' LT	0.17	138.4	136.8		137.6	0.999	137.5	154.9	88.7
	Section #2	#2		4	45+60			2.5' LT	0.17	138.4	138.9		138.7	0.999	138.5	154.9	89.4
															Lot Avg.		91.7
imate	Estimated Density (p) =		0.0759 Tons/ft3	Width (W) =	= 13ft	t Depth (D)	u	0.17ft Sub	Subject Size	200 Tons	П	Vol. of ACP in Sublot $(V) = (S)/(O) = (S)/(O$	= 2635.0 ft3		Lot Length to nearest 100 (A) = $V(R^3) / W(R) \times D(R) =$	1100 (A)	1190ft
Beg. Sta.		+	Sublot L.	Sublot Ln. $[(A) \times 0.2] = (L)$	1=(1)	238ft	Sta.	Sta. to Sta.			.007	Enumclaw		ACP Test Temp.	.dı	# 107	17
Test	Location Code	Code						Offset	Depth		Gauge Readings	sði	Avg. Reading	Corr. Fact.	Corrected	Rice Density	% of Rice
	Section #2	#2		4	48+00			7'LT	0.17	140.8	140.8		140.8	0.999	140.7	154.9	90.8
	Section #2	#2		47	20+80			4'LT	0.17	139.0	139.4		139.2	0.999	139.1	154.9	89.8
	Section #2	#2		u)	52+70			10.5° LT	0.17	141.6	141.6		141.6	0.999	141.5	154.9	91.3
	Section #2	#2		47	54+65			2.5' LT	0.17	139.3	141.8		140.6	0.999	140.4	154.9	90.6
	Section #2	#2		4,	26+90		,	6.5' LT	0.17	145.3	145.4		145.4	0.999	145.2	154.9	93.7
	Field to	Field tests performed using KCDOT Test Method N-1.	d using KC	DOT Test	Method A	V-1.									Lot Avg.	ا ا	91.3
Pavers:		Blaw Knox PF-5510 #711	#711									Rollers	Breakdown		Intermediate		
mark	wpoodw :s:	Remarks: Woodworth paved test section #1 on the plan sheet they planned	st section	#1 on the p	lan shee	t they plann	ed to p	to pave 1000 tons. The asphalt	is. The as	phalt			Sakai GW 750	N 750	IR 110 HF		
sed tk	oday had 1	placed today had 15% RAP and 3% RAS.	% RAS.										<b>G</b>		Add		
												Passes	4 Vibe	•	4 Vibe		
															2-3 Static		
												Roller Codes:		SDV - Single Drum Vibrator	m Vibrator	P.F	P-Pneumatic
este	₃r inform	Tester informed paving contractor and K.C. Inspector of the	ontracto	r and K.C	S. Insp	ector of th	_	day's test results.	ults.				\00	DDV Double Drum Vibrator	m Vibrator	TS - Tandem Steel	lem Steel

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

Last Revised: 1/7/2010



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> King County Hot Mix Asphalt Compaction Form

Color         1/2	DT 6270.0	$p_{\rm o}$ 50         End Ai $h(W) =$ 13ft $f(W) =$ 13ft	<u></u> □ [			1								_
Test Location   1384   2000 ft 2000   2000 ft 2000 ft 2000   2000 ft	0.0759 TO	$h(W) = 13ft$ $ x \cdot 0.2  = (L)$ Test Location $59+05$ $60+60$	Denth (D) =				oxler 4640B	#2659		Mix I.D.	<b>2</b>	D090088	Rand. #	
Test Location   Confecile   Sia fo Sia	00769 7.0	7 x 0.2] = (L) Test Location 59+05 60+60	1-1dan		Sublot (S)	Size	200 Tons			2635.1		ength to nearest $V(R^3) / W(R) \times DL$	100°(A)   (ft.)=	1190ft
Test Location   Offiset   Depth   Seade Readings   Avg   Reading   Seade   S	0.0750 Tons##3	Test Location 59+05 60+60		Sta. to Sta.			77	JC.	Enumclav		CP Test Tem	.dı	# J07	18
Septicary   Sept	0.0750 Tonefft?	59+09		δ		) Oepth	Gai	uge Reading	st	Avg. Reading		Corrected	Rice Density	% of Rice
144.6   146.2   145.6   145.	0.0759 Tonefft?	09+09		3.6		0.17	143.3	142.7		143.0	0.999	142.9	154.9	92.2
1444   0.899   144.2   154.9   154.9   145.6	0.0759 Tonefft3			ō		0.17	144.8	146.2		145.5	0.999	145.4	154.9	93.8
143,0   143,1   143,	0.0759 Tone##3	62+50		Û		0.17	142.9	145.8		144.4	0.999	144.2	154.9	93.1
143.6   143.7   143.3   144.0     143.7   14	0.0759 Tonsiff3	37+05		5.5		0.17	144.7	142.6		143.7	0.999	143.5	154.9	92.6
Lot Avg.   Lot Avg.   Lot.   Lot Avg.   Lot.   Lot.   Lot.   Lot.   Lot.   Lot.   Lot Avg.   Lot.   Lot.	0.0759 Tone##3	39+50		æ		0.17	143.3	144.0		143.7	0.999	143.5	154.9	97.6
Width (W) =   Depth (D) =   Size	0.0759 Tone/ft3											Lot Avg.		92.9
Acd   Acd	200000000000000000000000000000000000000	th (W) =	Depth (D) =		iolans (S)	Size		Vol. of ACP	in Sublot (V)	II	1,07	ength to nearest	100° (A)	
KCDOT Test Method N-1.         Offiset         Depth         Gauge Readings         Avg. Reading         Avg. Gauge Density         Reading Gauge Readings         Avg. Gauge Density         Reading Gauge Readings         R		$() \times 0.2J = (L)$		Sta. to Sta.	2		77			A	ICP Test Ten	ıp.	# ToT	
KCDOT Test Method N-1.         Rollers         Rollers         Breakdown         Intermediate           In #1 on the plan sheet they plan to pave 1000 tons. The asphalt         Rollers         Sakai GW 750         IR 110 HF           Passes         4 Vibe         2-3 Static           Roller Codes: SDV - Single Drum Vibrator	ition Code			0		Depth	Ga	เนge Reading	sß	Avg. Reading			Rice Density	% of Rice
KCDOT Test Method N-1.         Rollers         Breakdown         Lot Avg.           Intermediate         Sakal GW 750         IR 110 HF           Intermediate         P         DDV           Intermediate         P         A VIbe														
KCDOT Test Method N-1.         Rollers         Breakdown         Intermediate           ion #1 on the plan sheet they plan to pave 1000 tons. The asphalt         Rollers         Breakdown         Intermediate           P         P         DDV           Passes         4 Vibe         2-3 Static           Roller Codes:         SDV - Single Drum Vibrator														
KCDOT Test Method N-1.  Rollers Breakdown Intermediate Sakal GW 750 IR 110 HF Passes 4 Vibe 2-3 Static ROller Codes: SDV - Single Drum Vibrator														
KCDOT Test Method N-1.         Rollers         Breakdown         Lot Avg.           Intermediate         Sakal GW 750         IR 110 HF         DDV           Passes         4 Vibe         4 Vibe         2-3 Static           Roller Codes: SDV - Single Drum Vibrator         Roller Codes: SDV - Single Drum Vibrator														
CODOT Test Method N-1.         Rollers       Breakdown       Intermediate         Sakal GW 750       IR 110 HF         P DDV       PDV         Passes       4 Vibe         Passes       4 Vibe         2-3 Static         Roller Codes: SDV - Single Drum Vibrator														
Rollers Breakdown Intermediate Sakal GW 750 IR 110 HF Passes 4 Vibe Passes 4 Vibe 2-3 Static Roller Codes: SDV - Single Drum Vibrator	eld tests performed using KCDOT	Test Method N-1.									, confin	Lot Avg.		
ion #1 on the plan sheet they plan to pave 1000 tons. The asphalt  Passes  4 Vibe  2-3 Static  Roller Codes: SDV - Single Drum Vibrator	aw Knox PF-5510 #711								Rollers	Breakd		Intermediate		
Passes 4 Vibe 4 VIbe  Passes 52-3 Static  Roller Codes: SDV - Single Drum Vibrator	oodworth paved test section #1 or	n the plan sheet t	hey plan to	oave 1000 to	ons. The	asphalt				Sakal G	W 750	IR 110 HF		
4 Vibe 4 Vibe 2-3 Static Codes: SDV - Single Drum Vibrator	ad 15% RAP and 3% RAS.									<b>_</b>		Aga		
2-3 Static SDV - Single Drum Vibrator									Passes	4 Vit	2	4 VIbe		
SDV - Single Drum Vibrator												2-3 Static		
									Roller C		V - Single Dru	ım Vibrator	P-P	neumatic

Date 9/28/2009

Joe Karahuta

Field Eng./Tester

Last Revised: 1/7/2010

A Sullay

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# King County Hot Mix Asphalt Compaction Form

Date	9/25/09	Project		410th	4 Iour KAS Study	•												
Class	112" Lift		Start Air Temp.	· Temp.	50 En	End Air Temp.	79	Gauge			Troxler 4640B #2659	#2659		Mix I.D.	Σ	MD090088	Rand.	#
stimater	Estimated Density (p) =	0.0759	0.0759 Tons/ft3   Width (W) =	Width (W)	1_	13ft Depth (D) =		0.17ft S	Subior Size		200 Tons			2635.0 ft3		Lot Length to nearest $10^{\circ}$ (A) = $V(R^3) / W(R) \times D(R) =$	st 100°(A) D(ft )=	1190ft
Beg. Sta.	+		Sublot Ln	Sublot Ln. $[(A) \times 0.2] = (L)$	(7) = [2	238ft	Sta.	ta. to Sta.			700.	, jć	Enumclaw		ACP Test Temp.	.dı	Fot #	19
Test	Location Code			<u>†</u>	Test Location	Ę		Offset		Depth	Gai	Gauge Readings	v	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
-	Section #2				41+35			3'RT		0.17	144.4	144.5		144.5	0.999	144.3	154.9	93.2
2	Section #2				43+20			8.5' RT		0.17	138.0	139.1		138.6	0.999	138.4	154.9	89.4
6	Section #2				45+80			5.5° RT		0.17	142.5	145.2		143.9	0.999	143.7	154.9	92.8
4	Section #2				48+20			7'RT	Н	0.17	144.1	144.2		144.2	0.999	144.0	154.9	93.0
2	Section #2				50+50			3.5° RT		0.17	139.9	141.8		140.9	0.999	140.7	154.9	8.06
																Lot Avg.	6	91.8
stimate	Estimated Density (p) =	0.0759	0.0759 Tons/ft3	Width (W) =		13ft   Depth (D)	-	0.17ft S	Subjor Size		200 Tons	Vol. of ACP	Vol. of ACP in Sublot $(V) = (S)/(o) =$	2635.0 ft3		Lot Length to nearest 100 (A) = $V(H^3)$ / W/H) × D/H )=	St 100 (A)	1190ft
Beg. Sta.	+		Sublot Lr	Sublot Ln. $[(A) \times 0.2] = (L)$	2] = (1)	238ft	Sta.	Sta. to Sta.			T'	.00C	Enumclaw		ACP Test Temp.	ıφ.	# 107	20
Test	Location Code							Offset		Depth	g	Gauge Readings	<u>v</u>	Avg. Reading	Corr. Fact.	Corrected Gauge	Rice Density	% of Rice
-	Section #2				52+75			9.RT		0.17	140.1	141.6		140.9	0.999	140.7	154.9	8.08
2	Section #2				55+10			6' RT		0.17	142.0	143.9		143.0	0.999	142.8	154.9	92.2
m	Section #2	_			57+35			4'RT		0.17	143.6	143.4		143.5	0.999	143.4	154.9	92.5
4	Section #2				29+60			7'RT		0.17	146.5	145.6		146.1	0.999	145.9	154.9	94.2
2	Section #2				62+15			7.5'RT		0.17	145.8	145.0		145.4	0.999	145.3	154.9	93.8
	Field tests performed using KCDOT Test Method N-1.	performed	l using KC	DOT Test	Method	N-1.										Lot Avg.	. <del>6</del> .	92.7
Pavers:	: Blaw Knox PF-5510 #711	PF-5510#	711										Rollers	Breakdown	own	Intermediate		
Remark		paved tes	st section a	#1 on the	plan she	set they plar		to pave 1000 tons. The asphalt	tons. The	e aspha	Ħ			Sakai GW 750	N 750	IR 110 HF		
aced to	placed today had 15% RAP and 3% RAS	AP and 3%	% RAS.											<u>a</u>		DDV		
													Passes	4 Vibe	<u> </u>	4 Vibe		
													Roller Codes:		SDV - Single Drum Vibrator	um Vibrator		P-Pneumatic
														í				

9-25-09 RAP & RAS Lots 19 & 20

9/28/2009

Date

Joe Karahuta

Field Eng./Tester

Last Revised: 1/7/2010

### **APPENDIX F**

SE 416<sup>th</sup> Street Overlay: Shingles in Paving Demonstration Technical Support Document

**Skid Resistance Test Results** 



TO:

Kevin Kelsey Road Services Division King County Materials Lab

FROM:

Det. David C. Wells King County Sheriff's Office Major Accident Response and Reconstruction Unit - MARR

SUBJECT: RAS PAVEMENT DEMONSTRATION PROJECT—<u>DRY SURFACE</u> SKID TESTING

**SUMMARY:** 

Kevin,

Pursuant to your request for skid testing at the Enumclaw RAS site on SE 416 Street, between 212 Ave. SE and 244 Ave. On 10-12-2009, I and other MARR detectives contacted at the section of road to be tested. I had your site map which showed that there were four (4) sections of road surface to be tested, broken down into ½ mile sections.

The weather was overcast, windy and dry with a temperature of 54 degrees.

I started the zero (0) distance of the test section at 212 Ave. SE. The first skid tests were completed in what I am calling section #1, which was 0.3 miles east of 212 Ave. SE. Test section #2 was at 0.70 miles east of 212 Ave. SE. Test section #3 was at 1.35 miles east of 212 Av. SE and finally test section #4 was at 1.75 miles east of 212 Ave. SE.

Detectives were driving their normal assigned vehicles, consisting of one 2007 Ford Expedition; one 2005 Ford Taurus, a 2009 Ford Expedition and one 1999 Plymouth Voyager minivan. Tests were conducted using conventional braking and anti-lock braking (ABS) systems. Test speeds ranged from 34-52 MPH. The posted speed limit on SE 416 St. is 45-MPH.

All tests were conducted using either a Vericom VC 2000 or VC 3000 Braking Computer, which is a well established drag factor system used throughout the accident reconstruction industry and one that has been used by the MARR Unit for over 15 years involving thousands of test skids.

The grade was not a factor in any of the test sections as it was less than 1% where the actual skidding was done.

Please refer to the attached table for a breakdown of the test sections; type of vehicle used; average drag factors for both conventional braking and ABS.

#### **CONCLUSION**

It is the opinion of the MARR detectives that the test sections all have frictional values that are comparable to regular asphalt road surfaces throughout King County, under dry conditions. Section #3 was the lowest drag factor at 0.67. As an example, to show you the difference; if a vehicle was going 45-MPH and used hard braking all the way to a stop, the stopping distance with the 0.67 would be 101 feet. For a drag factor of 0.75, the stopping distance would be 90 feet.

Additional skid testing is scheduled for early November under wet road conditions.

Please do not hesitate to call if there are any questions

David C. Wells

RAS PAVEMENT DEMONSTRATION PROJECT-KING COUNTY MATERIALS LAB- DRY ROADWAY SKID TESTING TABLE

"F" Also Olemans		8 7 0.71	85 0.70	8	39	OVERALL AVG AVG 'FWITH 'T NO ABS ABS
		1235	0.85			
"f" NO ABS		8/0	n/a	n/a	0.78	
VC 2000	2009 FORD EXPEDITION					
"f" ABS		98.0	0.87	0.83	6.0	
"f" NO "f" ABS ABS		89.0	89.0	99.0	0.71	
VC 2000	Mer FORD EXPEDITION					
"f" ABS	11,000	n/a	n/a	n/a	n/a	
"f" NO		0.71	99.0	0.73	89.0	
VC 3000	200S FORD TAURUS					
ABS		n/a	n/a	n/a	0.83	
"f" NO ABS		92.0	92.0	0.63	89.0	
VC 2000	NOL					
	SECTION	-	7	3	4	

0.84

0.70



TO:

Kevin Kelsey Road Services Division King County Materials Lab

FROM:

Det. David C. Wells King County Sheriff's Office Major Accident Response and Reconstruction Unit - MARR

SUBJECT: RAS PAVEMENT DEMONSTRATION PROJECT—<u>WET SURFACE</u> SKID TESTING

SUMMARY:

Kevin,

Pursuant to your request for skid testing at the Enumclaw RAS site on SE 416 Street, between 212 Ave. SE and 244 Ave. On 01-04-2010, I and other MARR detectives contacted at the section of road to be tested. I had your site map which showed that there were four (4) sections of road surface to be tested, broken down into ½ mile sections.

The weather was steady rain, with a temperature of 45 degrees.

Per your request, I recorded the stationing ID at each skid location.

I started the zero (0) distance of the test section at 212 Ave. SE. The first skid tests were completed in what I am calling section #1(stationing ID 25+50), which was 0.3 miles east of 212 Ave. SE. Test section #2(stationing ID 47+50) was at 0.70 miles east of 212 Ave. SE. Test section #3(stationing ID 83+50) was at 1.35 miles east of 212 Av. SE and finally test section #4(stationing ID 105+50) was at 1.75 miles east of 212 Ave. SE. These locations were virtually identical in location to where the dry skid tests were performed.

Detectives were driving their normal assigned vehicles, consisting of two 2007 Ford Expeditions; one 2006 Ford Expedition and a 2009 Ford Expedition. Tests were conducted using conventional braking and anti-lock braking (ABS) systems. Test speeds ranged from 34-54 MPH. The posted speed limit on SE 416 St. is 45-MPH.

All tests were conducted using either a Vericom VC 2000 or VC 3000 Braking Computer, which is a well established drag factor system used throughout the accident reconstruction industry and one that has been used by the MARR Unit for over 15 years involving thousands of test skids.

The grade was not a factor in any of the test sections as it was less than 1% where the actual skidding was done.

Please refer to the attached table for a breakdown of the test sections; type of vehicle used; average drag factors for both conventional braking and ABS.

#### **CONCLUSION**

It is the opinion of the MARR detectives that the test sections all have frictional values that are comparable to regular asphalt road surfaces throughout King County, under wet conditions. Section #3 was the lowest drag factor at 0.65(non-ABS). As an example, to show you the difference; if a vehicle was going 45-MPH and used hard braking all the way to a stop, the stopping distance with the 0.65 would be 104 feet. For a drag factor of 0.75, the stopping distance would be 90 feet. Typically, over the past 15 years we have seen about a 5% to 10% reduction in frictional values under wet conditions versus dry conditions. For today's testing it was a 3% difference. I would consider that an excellent example of the adhesive properties for this asphalt.

Please do not hesitate to call if there are any questions

David C. Wells

RAS PAVEMENT DEMONSTRATION PROJECT-KING COUNTY MATERIALS LAB- WET ROADWAY SKID TESTING TABLE

AVGUETOS Tr. RACTORET STO ABS ABS		a Dide	a Australia	3	8	OVERALL AVG AVG 'FWITH 'F NO ABS ABS
		71 n/a	04 n/a	l n/a	7 n/a	
"f" NO ABS		9.0	0.7	0.71	0.7	
VC 2000	2009 FORD EXPEDITION					
"f" ABS		n/a	n/a	n/a	n/a	
"f" NO "f" ABS ABS	Entrange Court	9.02	959.0	209.0	0.693	
VC 2000	ZAGT PORD					
"f" ABS		0.825	0.80	0.846	0.83	
"F" NO "F" ABS ABS		B/II	n/a	n/a	n/a	
VC 3000	2007 FORD EXPEDITION					
"f" ABS		0.759	0.82	0.757	0.827	
"f" NO "f" ABS ABS	,	n/a	n/a	n/a	n/a	
VC 2000			N.			
	SECTION		7	6	4	

0.81

0.68